

The Addison-Wesley Book of  
**ATARI**  
**SOFTWARE 1985**

Dennis L. Foster  
and the Editors of the D. L. Foster Book Company

Complete with a listing of  
some of the best "free"  
public domain software

**The Essential Consumer Guide to Buying Software  
for Your Atari 400, 800, or XL Series Home Computer**

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of  
Atari Software  
1985**



# **The Addison-Wesley Book of Atari Software 1985**

by

**Dennis L. Foster**

and the editors of  
The D. L. Foster Book Company



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## **Foreword**

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When a novelist in Sonoma County, California wakes with the embers of dawn, she throws on a robe, heats the teapot, and switches on the personal computer sitting atop the kitchen counter. Not long ago, she couldn't have told you the difference between a daisy wheel and a magnolia leaf. Today she'll finish up her latest romance manuscript with a full screen text editor compatible with her publisher's typesetting equipment.

When a salesman in New Jersey finally earned his promotion to an executive position at his company's headquarters in Houston, he opened the phone book to the Yellow Pages. Calling around, he quickly located a book dealer who stocked a popular computer software guide. Three days later, his family move had been completely budgeted down to the penny. Today, he's successfully relocated in an affluent Houston suburb with all his tax deductible expenses securely organized on a floppy diskette only five and one-quarter inches in diameter.

When a chef in New Orleans throws his weary frame into a soft leather recliner after a hectic weekend in the kitchen, the next thing he does is to slide a diskette into his home computer's disk drive. As the subtle glow of the monitor lights up his eyes, a crafty smile creases his face. Tapping

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at the keyboard, he frantically manipulates an animated barbecue grill across a neatly trimmed lawn. Had he not found our book, this chef might never have grilled a single alien hamburger patty from outer space.

All these folks — and 10 million other Americans — have at least one thing in common. They use computers. These three particular individuals from opposite corners of the nation share another trait: each found a computer program for a very special need by consulting the software evaluations contained in this book.

#### Why this book in particular?

Our reviews focus on factors that are important to the user, no matter what the intended application. You'll find more than names and prices in this book. You won't find promotional descriptions written by a software company's ad man. What you'll find are subjective evaluations conducted by specialists in business, finance, education, health care, law, computer science, and the arts.

The D. L. Foster Book Company first began building a comprehensive data base of microcomputer software in 1979. Over the last six years the information pool has continually swelled not only in size but in scope and detail as well. The sources include numerous business associates in a wide range of industries and an equally large

base of clients and customers. As a consultant in computer science and education, I've personally reviewed several hundred programs in installation. As a software seller and developer, I've had to master and implement hundreds more. Through affiliation with computer learning centers, I've been fortunate to develop important inroads in educational software. As a contributing editor to computer trade journals (and as the author of this book), I continually receive new software for evaluation from nearly every reputable producer. Many of our evaluations were contributed by users, educators, executives, and professionals, and others were conducted by paid researchers. But one of our most important objectives is to make every review concise, readable, and free of computer gobbledegook.

It is only fitting to thank and acknowledge the numerous software suppliers who graciously submitted new products to evaluate for this 1985 edition, as well as those who rearranged their schedules to accommodate our analysts.

We sincerely believe this volume to be the most valuable guide to microcomputer software currently in print. Of course, we're equally sincere in our desire to build and improve future editions. The editors welcome feedback and suggestions from all our readers, as well as information about new

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software products that might  
make the "Addison-Wesley 500"  
in the future.

This book is dedicated to you,

the real architect of the Computer  
Revolution.

Dennis L. Foster



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# **Contents**

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## **I. Introduction**

A. How to Evaluate Software: A Practical Approach .....	1
B. Software Evaluation Work Sheet .....	8
C. The Atari Connection .....	10
D. Atari Computer Comparison Chart .....	13

## **II. Word Processing**

A. How to Evaluate Word Processing Software.....	17
B. Word Processing Evaluation Work Sheet .....	25
C. Atari Word Processing Comparison Chart .....	22
D. The Reviews.....	27

## **III. Decision Support**

A. About Decision Support Software .....	39
B. The Reviews	
1. Spreadsheet Software and Integrated Packages.....	44
2. Personal Finance and Taxes .....	47

## **IV. Data Base**

A. How to Evaluate Data Base Software.....	55
B. Data Base Software Evaluation Work Sheet .....	60
C. Atari Data Base Comparison Chart .....	61
D. The Reviews.....	64

## **V. Business**

A. How to Evaluate Canned Business Software .....	73
B. The Reviews.....	76

## **VI. Atari Education**

A. How to Evaluate Educational Software .....	83
B. Computer Learning Evaluation Work Sheet .....	86

---

C. The Reviews	
1. Early Learning Skills .....	88
2. Verbal Skills and Social Studies .....	113
3. Math Education .....	153
4. Science Education .....	185
5. Music Education .....	196
6. Curriculum Resources .....	206
<b>VII. Atari Entertainment</b>	
A. About Computer Games .....	213
B. Entertainment Software Checklist .....	215
C. The Reviews	
1. Video Action Games .....	218
2. Strategy, Sports and Combat Games.....	299
3. Adventure Fantasies and Mysteries .....	319
<b>VIII. Graphics, Languages, and Utilities</b>	
A. About Atari Utilities.....	341
B. The Reviews	
1. Atari Graphics and Sound .....	344
2. Languages: Interpreters, Assemblers and Compilers.....	353
3. System Utilities.....	362
<b>IX. Appendix</b>	
A. Public Domain Software .....	371
B. Glossary .....	376
C. The Sources: Vendor Index .....	382
D. Title Index .....	389

*“It is unworthy for men of  
excellence to labor like slaves over  
tasks that could be safely relegated  
to machines . . . ”*

*Liebnitz*



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## How to Evaluate Software: A Practical Approach

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The universe has long been a source of constant bewilderment. Imagine for a moment that you're the only being on earth. Imagine, too, that your warmth and well-being hinge not on the dependable rays of the sun but rather on the glimmering stars of the bleak night sky. Let's assume you have a machine that can transform starlight within a certain range of the spectrum into the life-giving rays you need. With tens of thousands of stars to choose from, how will you know which ones will provide the most warmth? The most light? Which ones produce light in the optimal spectrum?

As an Atari owner, you might not find this scenario so hard to imagine. The stars of the computer universe are the software programs that drive the machines. Like the stars in the heavens, there are tens of thousands of products with varying levels of power and effectiveness. For your own specific needs, application, and budget, where can you start?

As you may have learned by experience, software directories are often comprehensive but not often reliable. A source that merely lists titles and prices is almost no help at all. Software guides that paraphrase the suppliers' ads and brochures more often confuse than enlighten. In

our research, we found that many of the products listed in popular directories don't even work with the computer named in the title. A large number are no longer on the market, and a greater amount lack the kind of professionalism you expect from a highly priced commodity. This book provides evaluations and reviews of the top 500 software programs that will run on your Atari home computer. The titles were selected by a committee of specialists from different fields — business, education, psychology, computer science, and entertainment. An appropriate specialist reviewed each program and rated it according to several criteria. The reviews in this volume emphasize the traits that determine a program's ease of use, efficiency, and overall value.

### The Guidelines

Software evaluation is necessarily subjective. No two reviewers are likely to agree. Previous experiences with computers, good or bad, and cultural biases about how programs should be written make agreement impossible. The objective of our evaluation is not to pan a producer or preach about an application, but rather to equip you as an Atari user with pertinent facts essential to an intelligent buying decision.

With any software product — whether reviewed in this book or not — you should evaluate its

performance in light of several important factors: compatibility with your system, ease of implementation, level of sophistication required, performance in relation to price, design and clarity of video displays, availability of support from a supplier, suitability for the intended application, and quality of the user's manual or other documentation.

### System Compatibility

It is unwise to automatically assume that a particular program will run on your own system simply because a supplier advertises it as an Atari-compatible product. You'll find software supplied on cartridge (ROM pack), digital cassette, and floppy diskette. Some of the more popular products are available on more than one medium, but most are not. Be sure you understand specifically what system configuration is required. Many programs, especially business software, require two or more disk drives. Some products can be implemented with one drive but do not perform satisfactorily. Though a program may be available on cassette, a disk version will invariably function with more élan.

Consider also the minimum amount of main memory (RAM) required to hold and execute the program along with any data entries. Too often, a supplier will neglect to provide you with this specification before the purchase. Especially if you buy a product

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sight-unseen, make certain your own system has enough RAM to run it.

In this book, we indicate the **minimum** hardware requirements stipulated to run each program. You should also consider the optional hardware that might be required to make a particular program useful for your application — interface modules, printers, etc. Our ratings will include any extra hardware that is absolutely required, i.e. minimum RAM, disk drives, cassette player.

### **Ease of Implementation**

Find out how easily the program can be mastered. Some packages require a learning investment of weeks. At the other extreme, some are self-teaching or self-running.

Something most buyers overlook, to their inevitable chagrin, is the ease with which a program is installed. Many products have intimidating installation routines that require a working knowledge of hexadecimal notation and ASCII equivalents. Programs that generate hard copy — notably word processors and accounting packages — require, at a minimum, that you specify what model printer you will use. The better products offer a selection of commonly used printers for auto-installation. But if your particular printer isn't on the list, you'd better be prepared to write a custom "patch" program in assembly language — or else, look for another program.

### **Sophistication Level**

Try to match a product to your own level of computer experience. If you're a beginner, you won't be happy tackling an advanced product that assumes you're already familiar with assembly language and bit mapping. Yet if you're fairly experienced, you might be insulted or frustrated by a program reduced to very simple steps.

The rating system we use in this book includes three levels: "Begin." for beginners, "Exp." for experienced users, and "Adv." for advanced computerists.

### **Program Depth and Detail**

Evaluate the program's suitability for your intended application. You may think this step superfluous, until one day you acquire a product that "sounds" right in the ad but misses the mark in practice. For instance, not all accounting programs are suitable for every type of business. Some handle up to 100 accounts — others, 500 or more. Some can age accounts up to 120 days, while some do nothing but carry running balances. Even a game can fail to live up to your expectations. If you buy "Strip Cannasta" thinking you'll be treated to high-resolution pictures of you-know-what — and you're the only one that ends up stripping — you might feel like you've been taken to the cleaners.

List the details that a program should be able to handle. If departmental accounting and

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monthly variance reports are important to you, write them down on a comprehensive wish list. If you're a Grand Master, find out if the chess program knows Guccio's Piano.

### **Video Design and Clarity**

On the surface this factor may not seem very important, but in reality few traits have as profound an influence on user satisfaction. Large, block letters in glowing colors are terrific for children's programs but not particularly efficient in a business package. Look for readable text and concise design. A program should be visually appealing and based on professional design concepts. A program that merely portrays rambling words on the screen is of no more value than a book — and certainly not as economical.

Graphics are an important psychic benefit of computers. You'll certainly derive greater satisfaction from well-conceived, professionally executed displays that are clearly portrayed on your monitor screen.

### **Value For Your Money**

You can assess almost any consumer product in terms of its functional value. How well does a product's actual performance stack up against its purchase price? Incredibly, some programs priced under \$100 do most everything that others priced over \$400

can do. Marketing folks like to think that a product's value is whatever a consumer is willing to spend for it. To some extent this may be true. But like hardware costs, software prices have declined significantly in recent years. Today's more sophisticated, more professionally designed products often pack more value at a lower investment than the "industry mainstays" of only three years ago.

### **Overall Efficiency**

Input is the information you feed into a program. Output is the result, displayed on the screen, printed on a sheet, or both. "Throughput" is the complete process from initial entry of data to the final result. How efficient is a program in generating the end product — letter, ledger, spreadsheet, or score? How long will you have to wait for the program to load, change routines, display menus? How often must you insert, remove, reinsert diskettes? Many popular accounting programs take preposterously long times to post data after you're through entering it. Amazingly, some products require that you first install the software not once but every time you wish to run it. Avoid unpleasant surprises by evaluating overall efficiency first.

### **Quality of Documentation**

Some sort of instruction ac-

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companies every program on the market. Business products are usually supplied with user's manuals — presumably, comprehensive permanent references. Educational and entertainment programs often include brief pamphlets explaining installation, use, and maintenance. Unfortunately, most of this documentation is written by programmers, not writers. Very little of it is readable, much less lucid or comprehensible. In fact, poor documentation is the most common complaint of computer users.

Bad documentation is more than a mere nuisance. The user's manual is by and large your only learning aid. It is also your only reference to consult in a jam. Evaluate the documentation as seriously and as extensively as you would the program. No matter how powerful or efficient, a product is useless if you can't find an essential command.

In general, today's products tend to offer better documentation — professionally written, tastefully designed, and readably produced.

### **Support Availability**

No matter how efficient or well designed, a software product is ultimately only as good as its source. Don't overlook this frequently crucial criterion in the purchasing decision. You'll undoubtedly encounter problems with even the best programs — error messages you can't inter-

pret, installation nuisances, even outright flaws in the program. If there's nobody around to answer your questions, the product will be useless to you. Consider, too, that micro software is still largely a cottage industry in the infant stages of its development. Virtually every product on the market undergoes constant change and evolution, necessitating continual issuance of updates, enhancements, and supplements. Find out before you buy whether you'll be entitled to those reissues or whether you're simply scheduled for instant obsolescence. Of course, only a handful of the software producers engaged in competition today is likely to be around by the end of the decade. If your copy-protected program happens to crash — and surely it will someday — your entire investment will perish with the disk.

The best suppliers provide toll-free customer service lines to handle questions and problems. A trained technician should be available to translate arcane error messages, solve installation quandries, and elucidate gray areas. Vendors that make you pay for the service call yourself are less attractive, but still better than the secretive producer with no customer service phone at all.

Another critical attribute is warranty and replacement service. Any reputable software supplier will replace a defective program free of charge within an established warranty period — usually the first ninety days of ownership. Be

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absolutely clear on this point before you buy; there are few more distasteful experiences than discovery of a useless, \$300 disk that can't be replaced.

Producers that insist on protecting their program disks from being copied by your computer should at least provide an additional backup disk at no extra charge. Only the most professional outfits actually provide this benefit. But at a minimum, a supplier should charge only a nominal fee — a fraction of the original purchase price — for replacement disks. Forget to verify this policy before you purchase, and you may end up having to pay the full retail price in another year, just to keep your system running.

An equally important factor is the producer's staying power. If the vendor goes out of business in two years, you can forget about technical assistance, updates, and replacement disks altogether. The risk may be minor with a \$30 game program, but if a bookkeeping program crashes with \$50,000 worth of receivables hanging in irretrievable limbo, you may become a little more irritated to discover the software company no longer exists. Give weight to well capitalized companies with good reputations and solid market foundations. You can't always rely on trimmings, but it stands to reason that a financially sound company can afford to spend more on promotion, packaging, and documentation. Think twice before investing

in a program with a sloppily processed user's guide cranked out on a cheap dot matrix printer and reproduced on a mimeograph machine.

As every computer user knows, the biggest companies don't necessarily make the best products, but at least they're likely to be around when you need them.

### **Price**

Of course, the best software value in the industry is useless to you if it's still beyond your means. Price is the one inexorable component in every purchasing decision. Though you may be constrained by a set budget, you do have some options regarding product pricing.

For one thing, price fixing is illegal. No manufacturer, distributor, or franchisor can stipulate the price at which dealers or mail order companies sell software products to the public. As a result, it's impossible to publish a true "price" for any program reviewed in this book. Instead, we've relied on manufacturer's suggested retail prices or representative prices found in software stores and catalogs. In other words, the chances are very good that you'll actually find a specific product selling at a lower price from one or more sources.

Software and computer dealers usually adhere fairly closely to suggested list prices. Retailing is a high overhead business, with significant investments in inventory, personnel, and promotion.

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In contrast, the profit margins on computer products are relatively slim. The retailer relies on rapid turnover of high volumes of products to turn a profit.

You'll find better pricing from mass merchandise chains. Large organizations can simply afford to purchase products in greater volume, thereby lowering the cost per unit and passing along the savings to the consumer. Still better prices are associated with direct marketing companies, but the risks of a mail order software

purchase are high. There's only a handful of reputable mail order sources, despite stringent federal regulation.

Balance the purchase price against the services you expect to receive. For your handsome savings with a mail order purchase, be prepared to configure and install the software yourself. For a software dealer's full list price, demand added values like custom installation for your own printer and monitor and at least a moderate amount of instruction.

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# An Evaluation Work Sheet

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Here's a work sheet similar to the one our reviewers use. Copy it and fill it out for each program you contemplate buying. Evaluate each factor on a scale of one to ten. Add up all the scores to ar-

rive at a composite rating. By comparing one rating to another, you will have a sound indication of how a program's overall performance stacks up against another's.

## **1. System Compatibility**

- (9-10) Can be implemented on my existing hardware without modification
- (7-8) Can be implemented with only minor modifications
- (5-6) Some add-on hardware or software will be required to implement
- (0-4) Major investment in add-on hardware or software required

## **2. Ease of Implementation**

- (9-10) Easy to install, simple to learn
- (7-8) Moderately hard to install, easy to learn
- (5-6) Moderately hard to install and learn
- (0-4) A nightmare to install, a chore to learn

## **3. Sophistication Level**

- (9-10) Ideally matches my own level of background and experience
- (7-8) With a few exceptions, generally matches my own background and experience
- (5-6) More advanced or simplistic than I'd like, but I can adjust
- (0-4) Much too advanced for my know how, or far too simple for my tastes

## **4. Program Depth and Detail**

- (9-10) Excellent detail, meets most of my needs
- (7-8) Good detail, meets many of my needs
- (5-6) Some detail, meets my general needs
- (0-4) Little detail, far too general for my needs

## **5. Video Design and Clarity**

- (9-10) Professionally designed displays, lucid graphics
- (7-8) Decent displays, above average graphics
- (5-6) Acceptable displays, legible graphics
- (0-4) Amateurish design, hard-to-read graphics

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**6. Price/Performance Value**

- (9-10) Superior to comparably priced programs with similar objectives
- (7-8) Better than some comparably priced programs in this category
- (5-6) About the same as other products with the same price and application
- (0-4) Inferior to comparably priced programs in this category

**7. Overall Efficiency**

- (9-10) Excellent response time, superior throughput
- (7-8) Good response time, above average throughput
- (5-6) Acceptable response time and throughput
- (0-4) Unreasonably slow for my needs

**8. Documentation**

- (9-10) Plenty of examples, illustrations and lessons
- (7-8) A few examples and lessons
- (5-6) Enough detail to get started
- (0-4) User's guide poorly written and hard to understand

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## The Atari Connection

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Smaller than the nail on your littlest finger, more powerful than a room-sized computer of only a decade ago, few influences have had so profound an effect on American commerce as the microprocessor chip. In the wake of its introduction less than eight years ago, a new wave of industry "giants" has emerged at the forefront of a society rich in information and access to knowledge. Atari is one of them.

In many respects Atari is the great grandfather of the Computer Revolution. The company's founder, a creative engineer named Nolan Bushnell, launched the business on an idea for an electronic ping-pong game that could be played in pinball parlors and public taverns. Within a year, Bushnell had designed a version that could operate with standard television sets in the home — unknowingly planting the seeds for a commercial explosion that would be unparalleled in modern history.

The company has changed hands twice since 1976, growing to billion-dollar status under the corporate auspices of the Warner Communications conglomerate, then re-emerging under the ownership of the man who founded Atari's closest industry rival, Commodore International.

One of Atari's employees was an enterprising young engineer

named Steven Jobs, who "liberated" an Atari microchip for use in a science fair project he and a friend wanted to exhibit at the Homebrew Computer Show in San Francisco in 1977. His friend's name was also Steve, and their project — the Apple computer — made both men wealthy almost overnight.

Atari continued to manufacture and market self-contained computer game systems throughout the 1970s, exceeding \$500 million in sales by the end of the decade. In 1980, the Atari home computer lines was introduced, offering a full complement of color graphics, enhanced processing power, synthetic sound capability, and built-in expansion features at a dramatically low price. By 1982, the company was grossing more than a billion dollars annually. But in the two years that followed, costs of research for new product lines began to significantly erode Atari earnings, resulting in the company's sale in the summer of 1984.

Despite its roller-coaster history, Atari continues to rank among the leaders in microcomputer manufacturing and sales, supporting four primary product lines for home and personal computing.

Atari's wide and loyal following was built on the popular acceptance of two computer

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products, the "child-proof" Atari 400, and the "full-function" Atari 800. Designed for the uninitiated, first-time computer user, the 400 utilizes a membrane keypad in lieu of typewriter keys and includes 16K of main memory. The Atari 800, in contrast, is equipped with a standard typewriter keyboard and has a memory expandable to 48K. Both machines are characterized by splendid graphics capabilities and built-in sound — features other computer companies often market as add-on components.

The first Atari computer to offer a full 64K of main memory was the 1200XL, which has since been supplanted by a new "1400XL" series.

The 800XL today includes a standard 64K RAM and is fully compatible with software produced for the earlier 400 and 800 machines. The 1400XL has identical specifications but with an integral modem for telephone hookup and a built-in speech synthesizer. The most "complete" Atari, the 1450XL, adds to these features a built-in floppy disk drive.

The Atari operating system, or DOS, has undergone a few revisions over the years. The DOS is the computer's program for reading and writing data on disks and cassettes; this software translates electronic signals from peripheral devices like the monitor or printer, and interprets codes entered at the keyboard. As you can easily visualize, virtually

**nothing** happens without an operating system. More than that, a specific software program has to be compatible with the operating system software used by its computer.

Fortunately, the newest version of Atari's DOS, 3.0, is fully compatible with its predecessor, version 2.0. In other words, the current XL series will run all software designed for the earlier 400 and 800 models.

A word of caution about the ill-fated 1200XL: many programs designed for Atari machines must be modified to run on this model. In fact, some ROM cartridges won't even fit in the modified slot found on the 1200XL. These problems have been overcome on the 1400XL and 1450XL, both of which are fully compatible with all Atari software on cartridge, cassette, or disk.

A new CP/M module gives Atari users access to a large volume of high quality business software written for this popular but esoteric "Control Program for Microcomputers." However, you should be aware that simply because a program is written for the CP/M operating system does not mean it will run on your Atari system even with a CP/M module. The software must also be contained on disk in a form that can be read by your Atari disk drive. Not many CP/M software producers are in the habit of supplying Atari-compatible disks at this time; so if you purchase CP/M software you'll also have

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to find a source for transferring the program to an Atari-formatted floppy disk.

Considering the prolific library of powerful CP/M programs, you may find the nuisance — and the cost — worthwhile. In the meantime, you'll find an uncommon diversity of practical applications programs written specifically for the Atari operating system. As is typical of a rapidly-evolving technology, hardware advances have tradi-

tionally outpaced the development of new software. But Atari has made significant inroads into the educational and entertainment markets, where the product continues to reign supreme.

Consultants will advise you that for overall versatility in personal, educational, and recreational applications, few computers can rival the Atari line in terms of price, power, and program availability.

## Atari Computer: Hardware Comparison Chart

<b>MODEL</b>	<b>RAM</b>	<b>KEYBD</b>	<b>MODEM</b>	<b>SPCH</b>	<b>CART</b>	<b>DISK</b>	<b>COST</b>
400	16K	MEM	—	—	•	—	\$400
600XL	16K	TYP	—	—	•	—	\$200
800XL	64K	TYP	—	—	•	—	\$300
1400XL	64K	TYP	•	•	•	—	\$500
1450XL	64K	TYP	•	•	•	•	\$800

### KEY

<b>MODEL</b>	Manufacturer's model number	<b>MODEM</b>	Built-in modem for telephone hookup
<b>RAM</b>	Main memory (Random Access Memory) supplied as a standard component	<b>SPCH</b>	Built-in speech synthesizer
<b>KEYBD</b>	Type of keyboard — Typewriter (TYP) or Membrane (MEM)	<b>CART</b>	Built-in slot for ROM cartridges
		<b>DISK</b>	Built-in disk drive
		<b>COST</b>	Manufacturer's suggested list price



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## Word Processing

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*“Word processing has taken the drudgery out of writing, but has done nothing to improve publisher’s deadlines.”*

*Novelist Jan Flores*



## How to Evaluate Word Processing Software

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Kate was proud. In fewer than four months, she had budgeted, staffed, and equipped her company's first automated word processing facility. Despite opposition from disgruntled department heads, she had succeeded in assembling a secretarial pool from throughout the corporation. To christen her new realm, Kate arranged a special reception for the chairman of the board, the president, and various directors, vice presidents, and assistant vice presidents who happened to be in the building for an annual confab.

She arranged the thirty-six work stations in neat rows of nine, ordered champagne and pâté, and prepared a special message to be displayed on the monitors. At last the moment arrived. As the corporate officiates stood by ceremoniously, Kate nudged the master switch that was to "boot" the 36 computers and illuminate their monitor screens. She waited for the approving nods and congratulatory smiles.

Instead, an uproarious burst of laughter shook the room.

As Kate glanced at the nearest monitor, her heart froze in horror. An obscene noun danced in iridescent green streaks across every screen. Furiously, she rushed to the phone, called up her suppliers, and shouted: "My computers are @#\*\$ing all over the office!"

The story is true. Kate's living nightmare was not the result of sabotage. The author had inserted the unspeakable term when he first wrote the program, to appear whenever a certain software loading error occurred. When he readied the program for market, he forgot to remove the offending word.

By the way, the word processing program Kate bought is still on the market. In fact, it's one of the most popular products in its class. The obscene verb, however, is gone.

Word processing software for micros has long been associated with a wide variety of installation nightmares — many of them more aggravating, though less dramatic, than Kate's. Today's new generations of easier-to-use, more sophisticated word processors are less error prone and, for the most part, simpler to implement. Still, ease of installation should be a primary concern of every potential buyer.

Besides being simple to implement, word processing should be capable of accomplishing several objectives — some essential, some merely convenient. How a program handles these objectives is also an important factor. Let's examine each objective as it relates to your own word processing needs.

### Text Editing

Word processing should do more than merely type text. It should also permit unlimited revi-

sion prior to printing. How a program goes about revising text will determine, among other things, its learning ease and ultimate efficiency.

A simple **line editor** permits copy to be edited one line at a time. An electronic typewriter is an example. A **screen editor**, in contrast, allows an operator to move freely through the text to manipulate copy displayed anywhere on the screen. At a minimum, a word processor should be capable of the following editing procedures:

- Cursor positioning anywhere in a document
- Insertion of text at the cursor location
- Deletion of text at the cursor location
- Automatic word wrap (repositioning of a word too long for the end of a line onto the beginning of the next line)
- Scrolling (continual display of text too long for the monitor screen), both forward and backward.

Besides the above, some word processors incorporate additional conveniences:

- Page Jump (automatic display of any page in a lengthy document)
- Overtyping (simultaneous insertion of new text with deletion of old text)
- Automatic or manual page breaks displayed on the screen

- Delete options (ability to delete a single character, an entire word, line, or block of text)
- Rapid cursor movement (ability to move the cursor a word, line, or paragraph with a single keystroke)
- Omni-directional cursor control (ability to move the cursor in all four directions, not just backwards and forwards)
- Variable scrolling speed
- Universal cursor positioning (ability to place the cursor anywhere on the screen, whether filled with text or blank).

More advanced word processors have even greater powers:

- Undeletion (ability to restore text deleted by accident or after a change of heart)
- Automatic text reforming after changes are made (some programs leave gaps after deletions or extend lines beyond the margins after insertions).

### **Block Maneuvers**

After creating a document, you should be able to define any block of text, then move the block to another spot in the document. You should also be able to replicate the text in the defined block or erase it entirely. Different word processors handle these block maneuvers in various ways.

One technique involves placing a marker at the beginning of the text you wish to move or copy, then inserting another marker at the end. What happens next depends on the specific command you enter. With WordStar, the "move" command is "CTRL-KV". With some word processors, a single key (for example, "M") effects the move. If you execute this procedure, the defined text will vanish from its original spot and reappear at its new designated location. Depending on the program, the new spot may be the cursor location or the placement of yet another marker.

If you opt to copy the block, the original text remains intact, and a word-for-word duplicate appears at the destination. If you choose the delete command, the block disappears. Advanced programs permit text blocks to be copied not only within a document but also to or from a document in storage.

### **Document Assembly**

A word processor should be capable of linking two or more files, or appending a stored document to a new one. This capability permits the creation of a lengthy document in small sections for rapid assembly prior to printing.

The more sophisticated programs can actually compile tables of contents and subject indexes automatically.

### Rapid Form Fill-In

One of the most practical uses of word processing is the personalization of pattern documents. At a minimum, a program should be capable of merging text with some kind of data base, usually a mailing list. Some programs provide the option of entering variable data from the keyboard or using information stored in a list.

You first create the document — say, a passionate love letter. Depending on the program, you would insert some kind of non-printing code to indicate variable information. For instance, you might type: "Dear [Name], How my [Body Part] longs for you." When you decide to print a personalized copy to your nine favorite heartthrobs, the pattern document merges with your pre-defined data. One letter might say: "Dear Belinda, How my heart longs for you." Another might read: "Dear Marie, How my medulla oblongata longs for you." You could even send one to your mother-in-law: "Dear Ma/Law, How my springer spaniel longs for you."

### Phrase Library

An advanced word processor will permit you to store "boilerplate" text in a phrase library. Any frequently used paragraphs, page layout codes, or data can be retrieved from storage and inserted in a new document as needed. For in-

stance, you might have reason to repeatedly use the phrase: "And blessed are those who do the following." The phrase library function should enable you to call up the phrase whenever you need it and insert it at any spot in a document. Some programs use elaborate routines to accommodate this procedure. For example, you might first create a short file containing only the boilerplate phrase or paragraph, giving it a name as you store it onto a diskette. When you want to insert the phrase, you enter the command to "read" the boilerplate, then type the name of the file. More sophisticated word processors have simpler routines, using single-key commands to retrieve boilerplates.

### Page Formatting

Your word processor should enable you to design the printed page anyway you like. At a minimum you should be able to set page margins, first and last print lines, and line spacing. Some word processors can automatically number your pages. Advanced software permits pagination on all, even, or odd pages. You should also be able to insert headers or footers (messages in the margins) on any specified pages.

Some programs handle page formatting at the time of printing. Others display the text on the monitor screen exactly as it will look in print. Word processors use two types of techniques to

format the printed page. One method involves "embedded" codes inserted in the text file. The codes do not appear in the printout but guide the print operation with specifications for margins, spacing, pitch, and page length. An alternative method involves "format files" which contain all the specifications for the page layout but are not represented in the screen display. Some processors contain several different sets of pre-defined specifications suitable for correspondence, reports, manuscripts, even poetry.

With embedded codes, the text does not usually appear on the screen exactly as it will on paper. In fact, most often there is little similarity. With format files, the display typically portrays the printed word with acute accuracy. Some programs incorporate both techniques. **WordStar**, for example, can display double-spaced text and horizontal margins on the screen, but also uses embedded codes for such specifications as page length and vertical margins.

### Specialized Functions

In an era of increasing specialization, today's word processors often include advanced routines aimed at specific users. Some offer built-in math functions, columnar typing, and alignment by decimal point. Others provide

business graphics for creating charts, graphs, and simple diagrams. Most are compatible with at least one mailing list system and spelling proofreader. Many can be integrated with spreadsheets, data bases, and report generators. In this section, you'll find highly specialized word processors, ranging from programs written just for children to an electronic Bible processor.

In this section you'll find a Word Processing Evaluation Work Sheet. It lists many of the criteria on which a purchasing decision should be based. A program's suitability is a complex interaction of many factors, including the supplier's ability to support you over the long haul, the ease with which you can get the program up and running, and the degree to which the software's capabilities match your own requirements. No matter how powerful a program may be on paper, it's useless to **you** if it fails to operate your own printer properly, or is either too sophisticated or too simplistic.

Word processing is the number one application for microcomputing power. More than two thirds of the personal computers sold this year will be purchased primarily to handle this chore. In large part, your satisfaction with your own system will depend on the word processing package you select.

# A Word Processing Evaluation Work Sheet

---

## I. Editing

1. Type:  Full Screen  Line
2. Insert:  Mode change required  No mode change
3. Delete:  Character  Word  
 Line  To end of screen  
 To end of document  To beginning
4. Commands:  Single key  CTRL sequence  
 Function key  Multi-key

## II. Cursor Movement

1. Direction:  Backward & Forward  
 Omni-directional  
 Controlled by Arrow keys  
 Controlled by: \_\_\_\_\_
2. Options:  Word Left  Word Right  
 Next sentence  
 Next paragraph  
 End of text  Beginning
3. Placement:  Anywhere on screen  
 On text only

## III. Block Maneuvers

- Block delete
- Block copy
- Block move
- Block save

## IV. Document Assembly

- Append
- Link
- Spool to Printer

## V. Phrase Library/Boilerplate

- Save a boilerplate
- Insert a boilerplate
- Display on screen
- Retrieve on printing

**VI. Page Layout**

- |   |   |
|---|---|
| <input type="checkbox"/> Embedded codes         | <input type="checkbox"/> Format file            |
| <input type="checkbox"/> Pre-defined format     | <input type="checkbox"/> Optional formats       |
| <input type="checkbox"/> User-definable formats |   |
| <input type="checkbox"/> Left and right margins | <input type="checkbox"/> Top and bottom margins |
| <input type="checkbox"/> Page length            | <input type="checkbox"/> Page width             |
| <input type="checkbox"/> Line pitch             | <input type="checkbox"/> Character pitch        |
| <input type="checkbox"/> Justified text         | <input type="checkbox"/> Variable spacing       |
| <input type="checkbox"/> Pagination             | <input type="checkbox"/> Variable pagination    |

**VII. Printing Specifications**

1. Specifications

<input type="checkbox"/> Headers	<input type="checkbox"/> Footers
<input type="checkbox"/> Bold face	<input type="checkbox"/> Underlining
<input type="checkbox"/> Shadow	<input type="checkbox"/> Overstrike
<input type="checkbox"/> Subscript	<input type="checkbox"/> Superscript
<input type="checkbox"/> Same-page footnotes	
2. Display  
 On-screen preview

**VIII. Advanced Features**

- |   |   |
|---|---|
| <input type="checkbox"/> Math function          | <input type="checkbox"/> Business graphics  |
| <input type="checkbox"/> Auto table of contents | <input type="checkbox"/> Auto subject index |

**IX. Integration Capability**

- |   |                                       |
|---|---------------------------------------|
| <input type="checkbox"/> Spelling checker   | <input type="checkbox"/> Mailing list |
| <input type="checkbox"/> Spreadsheet        | <input type="checkbox"/> Data base    |
| <input type="checkbox"/> Graphics generator | <input type="checkbox"/> Other: _____ |

**X. Sophistication Level**

- |  |
|--|
| <input type="checkbox"/> Advanced: Extensive experience and know how required  |
| <input type="checkbox"/> Experienced: Some background helpful                  |
| <input type="checkbox"/> Beginner: No previous background or know how required |
| <input type="checkbox"/> Child: Learning experience only                       |

**XI. Production Environment**

- |   |
|---|
| <input type="checkbox"/> High output: Significant documentation requirements  |
| <input type="checkbox"/> Medium duty: Many proposals, reports, correspondence |
| <input type="checkbox"/> Light: Primarily correspondence, occasional reports  |

**XII. Budget**

- \$100 or less
- \$100 to \$250
- \$250 to \$500
- Over \$500

**XIII. Installation**

- No special installation required
- My printer can be selected from a printer menu
- Special routine must be written to drive my printer
- Additional hardware or software is required to run the program on my system

## Atari Word Processing Comparison Chart

The chart that follows portrays a cross section of representative word processors with their corresponding features. The table is designed for quick reference, not as a competitive endorsement of any particular products. The list does not include all the programs reviewed in this section, nor all the characteristics offered by the full complement of word processors. Instead, we've selected products based on their represent-

ative qualities for their respective prices and performance levels — and features based on their relative usefulness to most prospective users.

Because producers frequently update and enhance their wares, specifications for individual products may quickly change. Be sure to consult current specifications supplied by your software dealer or catalog center, and update the chart accordingly.

### KEY

<b>TITLE</b>	The product's common or commercial trade name	<b>BLK MAN</b>	Full range of block maneuvers — Move, Copy and Delete
<b>MIN RAM</b>	Minimum RAM in kilobytes required to implement the program	<b>GLBL S/R</b>	Global Search and Replace capability
<b>IMPL EASE</b>	Ease of implementation	<b>JUSTN</b>	Justification of text
<b>USER LEVL</b>	Level of user sophistication — Beginner (B), Experienced User (E), or Advanced User (A)	<b>DOC MAX</b>	Maximum document size in RAM during editing
<b>PRG DETL</b>	Program depth and detail	<b>BF UL</b>	Supports Bold Face printing (BF) and Underlining (UL)
<b>VALUE</b>	Value for your money	<b>FILE BKUP</b>	Automatic backup of document files
<b>EFFCY</b>	Overall efficiency	<b>MON SUPT</b>	Monitor size supported
<b>SUPPT</b>	Support availability	<b>TUT</b>	Tutorial supplied with the software
<b>DOCMT</b>	Quality of documentation	<b>COST</b>	Representative or suggested list price

TITLE	MIN RAM	IMPL EASE	USER LEVL	PRG DETL	VALUE	EFFCY	SUPPT AVAIL	DOCMT
AtariWriter	48K	9.0	B	8.0	8.5	8.0	9.0	8.0
Bank Street Writer	48K	9.0	B	9.0	10	8.5	8.0	8.0
Cut & Paste	48K	9.0	B	7.5	9.5	7.5	7.5	8.0
HomeWord	48K	9.0	B	7.5	8.0	7.5	7.5	8.0
Letter Perfect	48K	8.5	E	9.0	8.5	8.5	8.0	8.5

TITLE	BLK MAN	GLBL S/R	JUSTN	BF UL	FILE BKUP	MON SUPT	TUT	COST
AtariWriter	•	•	•	UL	—	38	•	\$100
Bank Street Writer	•	•	•	—	—	38	•	\$70
Cut & Paste	•	•	—	—	—	80	•	\$100
HomeWord	•	•	•	BF/UL	—	38	•	\$70
Letter Perfect	•	•	•	BF/UL	—	38/80	•	\$150

--- FORMAT DEFAULTS ---

- 0.> PREVIOUS MENU
- 1.> ACCEPT ALL
- 2.> TOP MARGIN: 10
- 3.> LEFT MARGIN: 10
- 4.> JUSTIFY: 1
- 5.> WIDTH: 64
- 6.> LINE SPACING: 2
- 7.> PRINTED LINES/PAGE: 112
- 8.> STOP AT END OF PAGE: 0
- 9.> FONT: 0
- 10.> MARGIN ADJUST: 0
- 11.> HEADER SPACING: 8
- 12.> FOOTER SPACING: 8
- 13.> INDENT: 0
- 14.> BOTTOM MARGIN: 0

SELECT [0-14] : 1

## AtariWriter

Atari

*System Requirements:* 16K, cartridge  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.0  
*Support Availability:* 9.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 8.0  
*Price:* \$100

The strongest trait of this officially sanctioned Atari word processing package is its ease of implementation. Menu-driven with an entry level command structure, the program is simple enough for most family members to master without a significant training cycle.

As a text editor, **AtariWriter** is fairly rudimentary, lacking the elegance of Bank Street Writer or the sophistication of Letter Perfect. However, the program does offer a decent repertoire of editing facilities useful for most, very simple document chores. The list includes block move and copy capability, a competent search operation, and a full-screen editing format.

Perhaps the most useful editorial feature is a block buffer designed to hold copy defined for a maneuver. To delete, move, or replicate a block of text, you mark the beginning and end. The marked text is stored in a "buffer" in the computer's memory. When you move or copy the block, the text is retrieved from the buffer and positioned automatically at the specified destination. When you use the block-delete function, the marked text is erased from the document

but its clone remains in the buffer in case you change your mind. As a result, you can "unerase" an accidental or unwanted deletion — or even "unmove" a relocation maneuver.

Although the Atari display only gives you a purview of 36 characters per line, you can preview the way your printed document will look before you have it sent to the printer. However, you have to scroll horizontally to peek at the portions of the document wider than the display window provided by your monitor. Unfortunately, you may find yourself overlooking duplicated words or characters appearing in different portions of the document beyond your viewing range. Still, a quasi-preview is better than no preview at all.

Atari advertises a form-letter feature supposedly designed for customizing pattern documents — e.g., repetitive hate mail to your ninety-nine most despised consumer ripoffs. Pragmatically, this feature isn't a form-letter function at all, but merely a variation of a standard document revision. When you create the pattern form, you simply leave blank spaces where you want to type in the information before you print

the document. There's no mail list module for automatic retrieval and insertion of names and addresses: you'll have to key in the variable data one by one each time you print a new version.

Lazy but competent, **Atari-Writer** is capable of handling very light production but is more aptly suited to tutorial applications in elementary word processing concepts.

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## Bank Street Writer

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*Broderbund*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 9.5  
*Program Depth & Detail:* 7.0  
*Value for Your Money:* 9.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 7.0  
*Documentation:* 8.5  
*Price:* \$70

Word processing is traditionally a mysterious art, engulfed in an aura of esoteric jargon and complicated keystroke sequences. Commonly, a trainee undergoes weeks of formal training and months of on-the-job practice to achieve mastery. Most self-trained users never do learn the full depth and capability of their word processing programs, even after several years of everyday use.

The Bank Street College of Education set out to change all that. Taking aim at elementary school children, the institution began work on a word processor so simple to learn it could be used to help develop children's writing skills. It would be virtually self-teaching and graphic, shed of complicated commands and hard-to-memorize keystroke sequences. The result was **Bank Street Writer**, a hallmark in the

application of microtechnology to early learning skills.

The most remarkable aspect of this program is the fact that it was so late in arriving. Hundreds of word processing packages preceded it in the marketplace, most of them merely variations of the traditional, esoteric approach to the problem. **Bank Street Writer** brings a refreshing regard for the psychology and needs of the uninitiated, first-time computer user — in particular, the elementary school student. Not overlooking the fact that many adults today still do not possess fundamental typing skills, this program is versatile enough for most members of most families.

**Bank Street Writer** is a true "home" software product, yet it packs many of the capabilities of more sophisticated (and more expensive) word processing pack-

ages. As a text formatter, the program is very basic but tidy. Like big-time word processors, the program wraps words from the end of a line to the beginning of the next line automatically. You can insert and delete as simply as with an electronic typewriter. You may delete or reposition entire blocks of text in a document — a trait associated with professional word processing systems. **Bank Street Writer** even offers document appending, to compile several files into a larger document. For instance, you might store just your name, address, and phone number in one file; when you need them at the top of a letter, you simply append the file.

Global search-and-replace is also a standard feature. You define a string of characters for **Bank Street** to locate — for instance, "Chubs". Then, supply a replacement string — say, "Skinny". **Bank Street** will delete "Chubs" everywhere it appears in the document, and replace it with "Skinny". The result? No more mimeographed letters at Christmas titled, "Dear Cherished Relative." Instead, everyone receives an original, complete with his or her own nickname known only to (and daringly used

by) other members of the family.

The program maps the way with on-screen prompts. **Bank Street** even automatically numbers pages at either the top or the bottom of the page — something a few of the higher priced word processors don't even do. The program takes advantage of the computer's graphics power, with reverse fields and highlighting.

Don't expect to give this program a workout. It's strictly for personal typing chores at home. Viewed in this light, it's more versatile and powerful than you might imagine. For secretarial applications or even light office duty, **Bank Street Writer** may disappoint and frustrate.

The program is accompanied by a lucid, easy to understand user's manual and back-up disk at no additional charge. A built-in instructional program tutors first-timers on basic procedures. Children consider **Bank Street** a delight, especially those with inclinations toward creative writing. I even know a 47 year old administrator of a vocational trade school who generates his every memo with this program — proof positive that **Bank Street Writer** titillates kids of any age.

## Cut & Paste

*Electronic Arts*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 9.0  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 9.5  
*Support Availability:* 7.5

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 7.5  
*Documentation:* 8.0  
*Price:* \$49

Look carefully at the screen. Below the letter you just typed is a green stripe containing the words: SAVE PRINT CUT PASTE CATALOG BUFF. Reading over the text, you decide to change the opening line: "My heart throbs for you like a puffed up frog." Move the bright green block to the beginning of the sentence. As you pass it over the line, each letter begins to glow. Now move the bright block down to the green stripe, placing it over the word "CUT". In a flash, the offensive metaphor vanishes without a trace.

If this scenario resembles your word processing fantasy, then **Cut & Paste** is your program. Tired of "cutting" copy, and want to paste? Just mark a spot with the bright block (cursor), before sending it on down to the "PASTE" command. More precisely, CTRL-C cuts your marked text into the buffer, and CTRL-P pastes down your marked text from the buffer to the designated spot.

**Cut & Paste** was designed especially for the home, with simplicity in mind. Yet it does include many features normally associated with more sophisticated word processors. Besides automatic word wrap and the simplified editing routine, automatic scrolling and widow/orphan control are also standard attributes. A widow is a paragraph chopped off at the last line by a page break, leaving an orphaned word or two stranded at the top of the next page. To circumvent this problem, **Cut & Paste** adjusts the last line printed on each page. You can also insert a "hard" page break where you want it, overriding the default setting. Automatic page headings and page numbers give this program an added touch of realism.

A 9-year old little leaguer who reviewed this program for us was moderately more impressed than his mother, a trained word processing operator. Then again, **Cut & Paste** was written just for him.

## HomeWord

Sierra On-Line

**System Requirements:** 48K, disk  
**Ease of Implementation:** 8.5  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 8.0  
**Support Availability:** 9.0

**User Sophistication:** Begin.  
**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 7.5  
**Documentation:** 8.5  
**Price:** \$70

**HomeWord** falls among the simplest, most rudimentary text processing packages available for microcomputers. Marketed specifically for home and personal use, this program offers a straightforward approach to light typing with a cartoony graphic style reminiscent of the Apple MacIntosh.

You select functions from a display of "icons" — little comic-book pictures that symbolize what you want to do. For example, when you want to open a document file, you move the cursor to a cartoon file cabinet. To print a document, you select a cartoon printer that appears to be realistically spewing out a mangled stream of continuous-feed paper. There are five icons in all, occupying fully a third of the working area of the display.

Though this approach clearly targets early learners who ostensibly can identify a comic-book file cabinet more quickly than the word "Save," the program is better suited for teens and adults. Viewed in this light, you might consider the icon menus to be a hindrance rather than a boon. It's not all that difficult (but considerably more efficient) to press "S" to save a file. Besides, most

users would gladly sacrifice the cartoony symbology for a full-screen document display.

Each menu selection branches to a second, more detailed menu. Now, all these menu routines take up space in the computer's memory and consequently, have to be shuttled back and forth from the disk. The result is a general slowdown of the editing process. If you have a single disk drive like most Atari users, you'll find yourself swapping the program and data disks with maddening frequency.

The program does have a decent repertoire of editing operations, with simple procedures for inserting text without erasing what's already been typed, erasing mistakes or changes of heart, and replacing individual words or phrases. Like most any word processor, **HomeWord** can search through your document for a specific word, then replace it with any word you enter. This "search-and-replace" operation can quickly substitute words throughout your letter.

**HomeWord** also has a few user-adjustable page settings. You can specify left and right margins, or change the margin settings in the middle of a docu-

ment if you like. The program can also center type automatically in a title or headline.

Your printed pages can include bold face text or underlined copy.

With its graphic orientation and simplified procedures, this is

a good choice for a family's first word processor. Though the program lacks elegance and is a lazy editor, it has a fresh, unin-timidating appeal for the novice wordsmith.

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## Letter Perfect

*LJK Enterprises*

*System Requirements:* 32K, disk

*Ease of Implementation:* 8.5

*Program Depth & Detail:* 9.0

*Value for Your Money:* 8.5

*Support Availability:* 8.0

*User Sophistication:* Exp.

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 8.5

*Documentation:* 8.5

*Price:* \$175

Atari users have long suffered for want of a professional-quality, commercial-grade word processing system.

Many word processors look good on the monitor but not so good on paper. Capable text editing is only half the measure of a capable word processor. No matter how efficiently a program manipulates displayed text, no bell or whistle can compensate for poorly produced printouts. Many of the most expensive and supposedly more sophisticated word processing packages produce awkwardly spaced hard copy — or printed pages bearing little resemblance to the operator's pre-conceived notion during editing. **Letter Perfect** seems to have been designed specifically in response to this dilemma.

This program produces beauti-

ful hard copy with such big-system printers as Qume Sprint, NEC Spinwriter, or Diablo. It spaces justified text almost as nicely as commercial typesetting equipment. Allegedly, **Letter Perfect** will drive any parallel printer sold, dot matrix or parallel. Like most any word processor on the market today, this one supports bold-face and underlined printing. But it is one of the very few that allows you to change fonts — in midstream, if it so strikes your fancy.

The program performs some very capable routines, including:

- global search and replace
- bi-directional scrolling
- automatic center-of-page function
- subscript and superscript (with printers capable of handling the codes)

- copy buffer for block maneuvers
- automatic page numbering on all or alternate sheets
- on-screen page formatting.

The documentation is reasonably attractive and lucid enough for most inexperienced users. However, as with the program itself, the manual is more easily mastered by an experienced user. Though the producer allows for single-disk operation, we do not recommend regular use without two drives. A sister program, **Data Perfect**, interacts with the word processor for list-merge operations.

This is a very strong program with exceptional printing results.

In general, the more ambitious a program, the slower it executes. Despite its machine-code programming, **Letter Perfect** is no exception to this rule. Especially with only one disk drive, accumulated wait time between routines may try your patience. The program's professional "looks" and extended versatility more than compensate for such a minor nuisance.

With outstanding graphic qualities and a full complement of features that constitute excellence in word processing, **Letter Perfect** is unquestionably the premier product in this category for Atari computers.

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## Text Formatter

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Atari

*System Requirements:* 48K, disk or cassette; Atari BASIC text editing software  
*Ease of Implementation:* 6.5  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.5

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$23

This program formats text for presentable hard copy reproduction. It's strictly a formatter, not an editor; before you use the program, you'll first have to create the content using a text processor, like Atari's Program-Text Editor.

**Text Formatter** has a limited scope. Its recommended use is the

creation of simple forms or memoranda that do not require elaborate formatting prior to printing. You must define the format for your output in the text of your document. If you're using the formatter with an existing text file, you'll first have to edit the file to make it compatible with the formatting program.

Format specifications are indicated by non-printing codes inserted in the text of the document. The file must be stored on disk along with the format codes. The program will set the line spacing and left and right margins according to the embedded specifications. You can also center copy in the middle of a page. None of the format changes are reproducible on the monitor; if you view the contents of the document file with your text editor, you'll see the codes exactly

as you entered them.

When you print your document, **Text Formatter** will retrieve the file from storage, read the embedded format codes, and print the text according to the specifications.

This product is rudimentary in scope, but capable enough to handle simple correspondence chores, notes, and other light documentation. It's no substitute for a general-purpose word processor.

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## Text Wizard

*DataSoft*

*System Requirements:* 32K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 7.5  
*Price:* \$50

The idea of **Text Wizard** is to transform your Atari computer into an electronic typing system similar to a commercial word processing machine. The program accomplishes many of its objectives, borrowing liberally from the principles of industry-standard document processors to create an affordable merger of editing flexibility and ease of use.

As a text editor, the program provides full screen cursor movement and control over text. Text is automatically "wrapped" at the end of a line — placing a

word too long for the end of a line onto the beginning of the next line — eliminating the need to enter a hard RETURN as you type. The cursor can be directed vertically as well as horizontally; you can move in any direction one space at a time, or skip to the top or bottom of the screen.

The operator edits copy in two different "modes". The "Insert" mode creates new spaces for characters as they are typed. For example, let's say you've already typed the word "FAME." If you move the cursor on top of the

"E", and type "IN," the result will be: "FAMINE." The other option is "Delete" mode, used to erase a single character, an entire line, or any specified block of text.

**Text Wizard** incorporates two powerful features of a commercial word processor: Block Replication, and Search-and-Replace. To replicate a block, you first mark the text you want to manipulate with the cursor; you can then move or copy the block to any other spot in the document. The Search-and-Replace operation permits you to substitute any word or phrase for another already contained in the file. For instance, assume you've written your standard holiday letter to the out-of-state relatives. Type the first version to any specified addressee — say, "Lucy, Ricky, and Family." When you're ready to print the

second letter, use **Wizard's** Search command to locate the names wherever they appear in the obligatory epistle. Then use the Replace command to substitute a fresh round of names — for example, "Dumpy, Sneezy, and Dopey." Voila: no more mimeographed letters addressed "Dear Beloved Relation." Instead, everyone receives an original, complete with their own pet names no one outside the family would dare repeat aloud.

If you're interested in drafting business reports, you may be interested to know that this program can read files created by VisiCalc.

**Text Wizard** offers decent flexibility in creating and revising brief documents, but has a limited repertoire of printer drivers. You won't be producing letter-quality correspondence on a serial daisy-wheel printer.



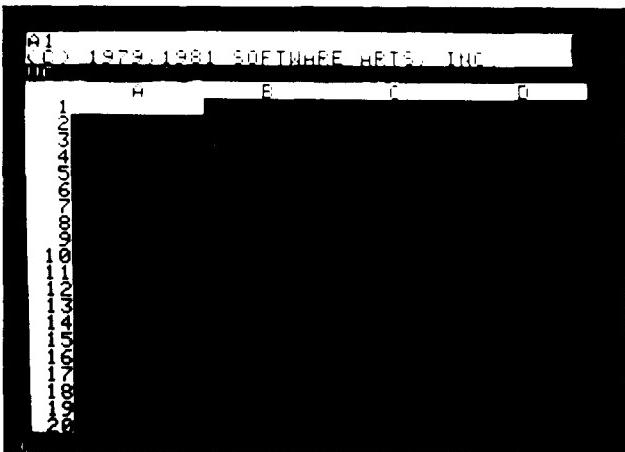
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## **Decision Support**

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*“Thinking moves from a  
doubtful to a settled situation . . . ”*

*John Dewey*



VisiCalc — Software Arts

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## About Decision Support Software

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Computer historians like to attribute the rise of the personal computer to the advent and instant popularity of the spreadsheet program. Indeed, more than any other event, it was this all-purpose, graphic modeling tool that finally gave small computers a large enough role in the "real world" to inspire popular acceptance. The spreadsheet is essentially an electronic scratch pad. It displays numbers and text in neat arrays on the console screen, then performs calculations on individual entries or complete or partial ranges of rows and columns. The program does not do much more than a note tablet and a handheld calculator. But it does it far faster and with a visual elegance no other product has been able to surpass.

The first spreadsheet to take the industry by storm was VisiCalc. A mind boggling miscellany of imitators succeeded it in the marketplace. Today, some of these "Etc.-Calcs" actually out-perform their illustrious ancestor. Others are mere lookalikes, while still more are highly specialized for particular uses or industries. A whole new market of Calc templates has also emerged, consisting of nothing more than pre-prepared models for popular, existing spreadsheet programs.

Spreadsheet generators fall in a generic category of software designed for individual decision

making. These programs are not designed to run a corporation, store vast volumes of scientific data, or test structural theories about space travel. They are simply direct and powerful tools for reinforcing the individual's ability to make better decisions more quickly. You define the application. The program tests your options. This category of programs is best known today by the term "decision support software."

The budget variance report that a corporate manager receives every month is a classical decision support format. The spreadsheet permits a user to enumerate income and expense for every month of the year or every year of a multi-year plan. The program computes monthly net profit or loss, cumulative cash flow, and annual totals for each item. Change one variable anywhere in the budget, and the spreadsheet automatically recalculates all the affected values. Test the impact of increased sales, varied expenses, payroll increases — any item at all — and instantly realize the effects of your decision making options. You could just as easily use the same technique to analyze investment decisions, test tax strategies, or budget household expenditures.

Not all decision support programs use modeling techniques. Some are simply sets of formulas that compute results like internal rate of return, net cash flow, or

depreciation based on the information you supply.

When you evaluate a decision support program, determine whether or not it is suitable for both your application and your level of sophistication. With a spreadsheet, you'll have to engineer your own models based on formulas, labels, and design features you define yourself. With some special-purpose spreadsheets and templates, you simply key in the data. Ask yourself, too, whether or not you'll need to have the computer sort through the models for specific information. If so, look for a spreadsheet with a built-in sorting function.

A convenience you might consider is the ability to merge tables produced by a spreadsheet with a document generated by your word processor. Some, but not all, spreadsheets can exchange information with word processors — and of those that can, most work only with one word processing program.

Decision support is one of the most useful things a personal computer can do for its owner. Beyond word processing, beyond bookkeeping and file management, a modeling program can empower you to see the future as well as the past — in a graphic form you can easily interpret. It lets you evaluate options by previewing their effects and weigh the variables that influence the outcome.

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## **Spreadsheet Software and Integrated Packages**

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*"Prices regularly rise not only  
when there is actually scarcity but  
also when there is an apprehension  
for the future . . . "*

*Julius Caesar*

# The Predictor

Artworx

*System Requirements:* 48K, disk  
*Ease of Implementation:* 7.5  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.5  
*Price:* \$30

**The Predictor** is a modeling tool based on multiple linear regression. Technically, it's not a spreadsheet program in that it doesn't rely on user-supplied formulas. However, this program addresses many of the same objectives of a spreadsheet tool, viz., modeling and forecasting of numeric phenomena, and permits creation and editing of data in tabular form.

The idea of regression is to analyze existing data with a view toward recurring patterns. A regression program constructs a mathematical model for an established set of figures, expressing the relationship as an equation. The program should then be able to use this equation to predict future results.

**The Predictor** is a simple facility for executing the regression process using a standard, "least squares" statistical technique. Simply stated, the program identifies the smoothest trend in a set of data in order to create the

model equation. The user enters historical data for the desired process; typical sources include sales figures, expenses, profits, stock prices, bond yields, and commodities prices. The technique is equally valid for product reliability data, staff productivity figures, or market acceptance studies.

"Multiple linear regression" may sound intimidating, but the program is relatively painless to use. System commands require only a simple "Y" or "N" to execute. You can change any of the data in your table to recast the entire model and view the impact on future performance.

**The Predictor** handles all its computations with a view toward statistical interpretation. The product will be appreciated best by stock market analysts, researchers, and statisticians for whom regression analysis is an integral component in everyday productivity and decision making.

## RPN Calculator

*Atari*

**System Requirements:** 16K, cassette; 24K, disk;  
Atari BASIC  
**Ease of Implementation:** 8.0  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 7.5  
**Support Availability:** 8.0

**User Sophistication:** Begin.  
**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.5  
**Documentation:** 7.0  
**Price:** \$25

As its name implies, this program simulates an RPN (multi-stack) desktop calculator, complete with illustrative display. The screen gives you a concise snapshot of five stack registers and twenty memory "addresses" as you punch in figures for computation, they appear in the "stack." For use in lengthy calculation routines, you can store intermediate results in any of the memory registers.

The memory display scrolls vertically to let you check the con-

tents as needed. You can also print a listing of all the figures currently held in the registers for hard copy reference as you develop a problem. When you're ready to proceed with a new problem, you can clear all the registers with a single command.

**RPN Calculator** supports standard arithmetic operations as well as trig functions, logarithms, and statistical measures. To boot the program, you first load the Atari BASIC cartridge.

## SynCalc

*Synapse*

**System Requirements:** 48K, disk  
**Ease of Implementation:** 8.0  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 8.5  
**Support Availability:** 8.0

**User Sophistication:** Begin.  
**Video Design & Clarity:** 7.5  
**Overall Efficiency:** 8.5  
**Documentation:** 8.5  
**Price:** \$100

**SynCalc** is a commercial-grade spreadsheet generator designed with ease of use in mind. The program relies on menu options rather than arcane command se-

quences for most operations. System characteristics include a selection of standard VisiCalc features, including direct access of any cell, formula entry, and a

full complement of row/column maneuvers. In addition, **SynCalc** augments these processes with some sophisticated video tricks.

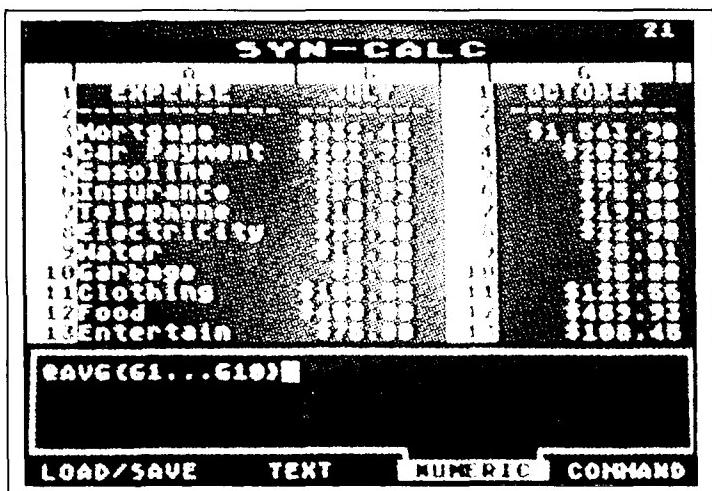
For one, the program has a split-screen capability that lets you view two portions of the spreadsheet simultaneously. Because you can create either horizontal or vertical windows, you have an option of comparing rows or columns. For instance, by dividing the screen vertically, you can display row titles and a full column of figures in one window, while displaying a "Totals" column in the other. If your titles represent expense items — and your col-

umns, months of the year — you could display the annual summary in the right-hand window. When you modify an expense figure in the displayed monthly column, you'll instantly see the impact on the "bottom line" shown in the summary column.

Like the better modeling tools used with commercial systems, **SynCalc** offers full flexibility in column dimensions. You can change the width of any individual column to accommodate your entries. Moreover, you have the choice of centering or justifying your figures in each column.

A third feature that adds power and utility to an otherwise standard set of functions is the ability to incorporate Boolean operators in your expression — e.g., OR, and IF...THEN.

The software is supplied with a reasonably complete users' guide reduced to simple steps. Overall, **SynCalc** is a friendly, highly versatile spreadsheet program with a good ratio of price to performance. Its visual qualities of readability and clarity are only average.



**VisiCalc**

Software Arts

System Requirements: 48K, disk

Ease of Implementation: 8.0

Program Depth &amp; Detail: 8.0

Value for Your Money: 7.5

Support Availability: 8.0

User Sophistication: Begin.

Video Design &amp; Clarity: 8.0

Overall Efficiency: 8.0

Documentation: 8.0

Price: \$250

This is the Calc that launched a thousand chips. Perhaps no other development has influenced the direction and shape of the micro-computer industry as profoundly as the advent of **VisiCalc**. Its "look", "feel", and architecture are benchmarks by which other spreadsheet programs are measured. There are more powerful, easier to use, more flexible Calc programs. There are specialized spreadsheet generators for particular industries and applications. But none have played such an historic role nor been so instrumental in the creation of so many business plans, budgets, financial statements, and reports.

**VisiCalc** is first of all an electronic blackboard. The direction keys control cursor movement vertically or horizontally anywhere on the screen. Wherever you position the cursor on the blackboard, you may write numbers or titles. Secondly, **VisiCalc** is a calculator. You can perform arithmetic operations on any numeric data on your blackboard. If you enter formulas, the program can recalculate all your results when you change one or more variables.

For instance, you might create three columns titled "PROD-

UCT," "COST," and "RETAIL." Assume that you enter names of various products in the first column — "WIDGET," "WOCKET," "WATSIT," etc. In the second column, you enter the wholesale cost for each product. Now, in the third column, you'd like to calculate the retail price, assuming a net profit of 40% on each item. Simply enter a formula for the first item, dividing the number shown in the "COST" column by .6 (if your net profit will be 40%, the wholesale cost must be 60% of the retail price). Then use a **VisiCalc** command to duplicate the formula for all items. Not only will the "RETAIL" column be calculated automatically, but any changes in the "COST" column — or in the formula for net profit — will be reflected instantly.

**VisiCalc** can sum an entire row or column of figures, calculate averages, determine extrema (minimum and maximum values), even produce the present value of future revenues. The user can toggle the automatic recalculation feature on or off. Columnar data or formulas can be replicated anywhere on the blackboard. Selectable formats can display any single entry, column or row

as integers or dollars.

To move the cursor to a specific address, enter “/B”. To move a column or row, position the cursor on the desired column or row, and type “/M”. Then move the cursor to the destination and hit RETURN. The command to replicate a column of figures is “/R”. “/G R A” toggles the automatic calculation mode on, and “/G R M” switches it off.

**VisiCalc** can handle a spreadsheet with as many as 63 columns and 254 lines. The user can move the cursor to any designated cell by entering its row and column numbers. A split-screen display permits simultaneous viewing of two different portions of the spreadsheet. There is even a set of trigonometry equations for more sophisticated applications.

Though **VisiCalc**'s performance may sound ingeniously simple, its use is not so easy to master. With this program, knowing the theory is more important than grasping the commands. The typical learning time ranges from 12 to 30 hours. An uninitiated, first timer

might consider investing in an add-on tutorial module like the CDEX training program. The program is also not terribly keyboard-efficient. The going is slow until you achieve complete proficiency.

Fortunately, this product is extremely well supported by independents. There are a number of books on the market containing lists of entries for creating a diversity of spreadsheet models. Too, several software producers offer special-purpose **VisiCalc** “templates” already set up and ready to accept your own data

**VisiCalc** can store or print any spreadsheet you create, but we recommend using a printer capable of condensing characters. This product's best applications include business forecasts, monthly budgets, financial and operating statements, inventory and price lists, and statistical reports. A beginner can operate the program, but an experienced user will derive more benefit from its capabilities.

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## **Personal Finance and Tax Programs**

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*“Besides, you’ve already paid your respects  
To tax deductible charity organizations . . . ”*

*Bob Dylan*

## Car Costs

*Creative Software*

*System Requirements:* 32K, cassette  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 5.5  
*Value for Your Money:* 4.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 7.5  
*Overall Efficiency:* 6.0  
*Documentation:* 5.5  
*Price:* \$20

**Car Costs** contains a filing system for tracking and summarizing personal vehicle expenses. Though this program may have been originally conceived for family applications, its clearest value is the ability to organize auto expenses for tax purposes or reimbursement by an employer.

Logging vehicle expenses is not particularly difficult; what's demanding is remembering to record every tank of fuel, quart of oil, and maintenance visit in the little book stored in the glove compartment. **Car Costs** does not supplant the tedious chore of maintaining an accurate log book, but it helps streamline the

process of computing periodic totals.

Don't expect to be able to do away completely with your manual auto records; you'll still need hard copy receipts if your income tax claim is audited. This program simply stores the date of each expense or service along with the applicable source and cost. The software performs all the arithmetic to produce categorical or summary totals.

The main drawback to this product is its inability to interact with a tax preparation or household finance program. To transfer data from **Car Costs**, you'll have to re-enter the figures manually.

## Home Accountant

*Continental Software*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 7.5  
*Documentation:* 8.0  
*Price:* \$75

Abundant detail and vivid graphics characterize this checkbook-oriented budgeting

program for Atari households. The producer, Continental Software, is known for its repertoire

of financial analysis and accounting software — added values of this professionally designed bookkeeping package.

The program incorporates virtually all of the standard hallmarks of a good home budget system — an amplitude of user-definable budget categories, multiple-account capability, register maintenance, and check printing. In addition, the authors have borrowed several features from professional finance packages, including departmental distribution, correlation of transactions for tax purposes, preparation of financial reports and analyses, and graphic portrayal of budget performance.

The system accommodates up to sixty different budget accounts, all of which can be customized by the user to reflect his specific income and expense items. This is an especially good program for users with significant credit card transactions to

monitor; **Home Accountant** generates an individual balance for as many as five different accounts.

Enter your own budget figures for each category you've defined, and the budget will compare your actual income and expenses with your assigned budget figures. You can generate separate analyses for incoming and outgoing revenue, or a budget comparison report in either printed or graphic output.

This is one of the few home accounting programs that permits distribution of expenses over several accounts. When you record a check, you can post the amount in fractions over separate budget categories. This facility accommodates self-employed individuals and professionals who need to segregate personal transactions from business accounts.

**Home Budget** has fine production values, including high-quality output reminiscent of commercial financial systems.

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## Home Financial Management

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*Thorn EMI*

*System Requirements:* 16K, cassette  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.0  
*Documentation:* 7.5  
*Price:* \$40

This cassette-based household budgeting tool provides the essential ingredients for a simple home

financial management system. It's simple, concise, and tidy — though not particularly extensive

or detailed. Still, at a suggested list price of \$40, **HFM** is a decent value for users whose budgeting needs are not especially complicated.

If you're a typical Short Form 1040A user, this product will probably meet most of your needs. It provides a set of budgeting categories for logging income and expenses — food, housing, clothes, auto, and the like. You key in a budget figure for each category, typically the

average of the monthly amounts you paid out in each category over the last year.

When you've completed the budget entries, the program will help you visualize your family cash flow — in a printed summary or bar graph.

This is an easy to use program with decent graphic qualities, recommended for families who do not itemize tax deductions or have more than a single source of income.

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## Home Inventory

### Creative Software

*System Requirements:* 16K, disk or cassette  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.0  
*Documentation:* 7.5  
*Price:* \$20

This simple, dedicated data base system has a unique but valued application — permanent maintenance of information about your personal property. Describing and valuating your belongings is the first thing you're likely to do when you acquire a new homeowner's insurance policy. Without detailed and accurate records, you have no manageable basis for claiming losses in the event of catastrophe. Of course, this computer-based system is postulated on the assumption that the disk or

cassette on which you store your records will not be numbered among the losses.

The program consists of two simple routines — one for entering descriptions of your inventory items, and another for displaying and summarizing. You can create as many as a hundred different classifications for your belongings. You'd be wise to categorize hard goods like appliances and furnishings in a separate class from, say, clothing and linens. Insurance adjusters have different methods of valuating specific properties.

**Home Inventory** produces summary listings of all the items stored in the inventory, includ-

ing a total valuation of all the property.

## SynStock

*Synapse*

*System Requirements:* 48K, disk

*Ease of Implementation:* 8.0

*Program Depth & Detail:* 8.0

*Value for Your Money:* 8.5

*Support Availability:* 8.0

*User Sophistication:* Begin.

*Video Design & Clarity:* 8.0

*Overall Efficiency:* 8.0

*Documentation:* 8.5

\$100

This colorful portfolio analysis program provides an integral data file for maintaining descriptive and price information about your securities investments. **SynStock** tracks performance and generates trend data in lucid, graphic form based on conventional plotting techniques.

The user supplies specific data on each investment — stock name, description, and pricing information. The system must be conscientiously updated to generate accurate trend analyses.

**SynStock** will assimilate performance of designated stocks over the history of the investment and calculate the trend. The program uses a moving average to assign weight to the most recent trend factors and compensates for vertical "noise" (short-term fluctuations with little bearing on the overall trend).

You have the option of depicting trends for individual stocks or evaluating the performance of your complete portfolio.

# SynTax

## Synapse

<i>System Requirements:</i>	48K, disk	<i>User Sophistication:</i>	Begin.
<i>Ease of Implementation:</i>	8.0	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.0	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.5	<i>Documentation:</i>	8.5
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$70

**SynTax** is a simple tax preparation tool that provides a format for on-screen entry, automatic arithmetic, and printing of a limited selection of standard IRS forms. The core of the program is an electronic Form 1040, into which the operator keys each line of information. The fields are organized in the same general sequence as the tax form.

Entries can be transferred to appropriate lines from attached schedules with simple command codes. For instance, you can automatically retrieve your total dividends, capital gains, and business income for automatic insertion in your tax return.

When you've entered all the

fields, **SynTax** performs all the arithmetic specified by the IRS. The program will print the results on standard tax forms.

This product is strictly for taxpayers with simple finances and little need for data gathering and preparation. **SynTax** does not organize your financial information for you; the program requires the same arduous organizing as the IRS forms. This software supports Form 1040 and schedules A (Itemized Deductions), B (Interest and Dividends), C (Profit or Loss from Business or Profession), D (Capital Gains and Losses), G (Income Averaging), and SE (Self-Employment Tax).

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## **Data Base**

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*“Since the dawn of history there has been a constant accumulation and classifying of facts. But what is classification but the perceiving that these objects are not chaotic... but have a law which is also the law of the human mind?”*

*Ralph Waldo Emerson*

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**File: Sample              Date: 12/31/81              Rec: 0**  
**OPTIONS: Yes, No**  
**COMMAND: -Verify-**

**Fields: 5**  
**Record Length: 178**  
**Max # Of Records: 782**  
**# of Rec: 382**  
**Active #: 380**  
**Created: 07/04/81**  
**Updated: 12/17/81**  
**Formulas: 0**

**Load Data Base?**

Data Perfect — LJK Enterprises

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## How to Evaluate Data Base Software

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Few computer terms are so widely misunderstood yet so prevalently used as "data base management." Part of the problem is that the phrase has varying connotations depending on the computer, environment, and application. A data base can be immense or minuscule. It can be managed like a card file, or manipulated like a spreadsheet. It can be sorted like a deck of playing cards, or cross-referenced like an intricate matrix.

In all instances, large or small, simple or complex, a data base is a pool of information. In a multi-user environment, any operator on line to the pool can access data stored there. With a single-user system (most likely your Atari is one), only one operator can get to the information at any given time.

The data base consists of several "files." Like the folders in a file cabinet, data files are labeled with an identifying name and set up to store a common group of information. Inside the file can be stored a number of "records" — a specific set of data for a single customer, account, part, student, etc. For the sake of illustration, let's say you're the personnel manager for a champagne bottling company. You have a large file cabinet with several drawers. In each drawer is a set of fifty or so file folders. One folder is labeled "Employ-

ees," another is labeled "Payroll," and a third is titled "Cash Requirements." Now, the Employee file contains records of all your workers, both hourly and salaried, in the form of pre-printed information sheets. We'll assume that for this purpose you use the job application form completed by each employee at the time of hire. Each form has a number of printed items with blank lines filled in by the employee or, in some instances, by the supervisor or yourself. There's a separate form for every employee in the company. Now suppose your insurance agent calls and asks for the birth date of Miss Burgundy White who works in Accounting. Finding her file should be no problem: you simply pull out the drawer, find the file labeled "Employees", and — assuming the forms are all neatly arranged in alphabetical order — pull out Miss White's application form. There on the line labeled "Date of Birth" is the (alleged) data.

The example of the Employee file is the simplest form of data base. With a basic "file manager" program, the folder is your "data file," each individual form is a "record," and the items listed on the form are called "data fields." With most such programs, you enter data from the keyboard onto a "form" displayed on the monitor. To retrieve a record, you enter a key word or phrase — in this instance, the employee's name. Most file management software

can sort through the records to create special reports. In our example, the program would print mailing lists, labels, or employee lists in alphabetical or zip code order.

But a full-fledged DBMS should be able to do more than just store, sort, and retrieve. More sophisticated programs have built-in math powers to perform computations on the data stored on file prior to printing. In our example, let's assume your "Payroll" file contains weekly records of each employee's earnings. Each sheet contains the rate of pay, number of hours worked, calculated gross pay, state and federal deductions, and finally, net earnings for the week. With DBMS software, the computations could be performed automatically. Some programs create a separate file for the results of the calculations; others use just one large pool of information, performing the desired calculations only when a report is generated. In the latter approach, the reports aren't stored. Whenever the user requests a pay check to be printed or a trial balance to be displayed, a fresh set of computations is executed. Still more sophisticated programs can merge information from separate data files and manipulate hierarchies of sub-files.

In our example, we have one remaining file folder to consult: the "Cash Requirements" file. This file will tell us how much cash is needed to meet the payroll. In our conventional filing

system (similar, by the way, to a conventional accounting program), you would have to sum all the net earnings lines from all the employee payroll records to calculate this amount. Worse, you would also have to sum all the deductions lines to figure how much payroll tax to deposit. A sophisticated DBMS could automatically generate these new, system-wide totals from the individual totals, again without creating any new files.

The main problem, from the user's point of view, is how to get all this computing organized in the first place. Hardly any of the data base software on the market is ready to run. With a sophisticated DBMS program, the user has the freedom to define any kind of file he likes — determining the number, type, and length of all the fields. He can also specify calculations, both within a record and at the time a report is generated. Unfortunately, the steps required to establish these options can be horrendously complicated.

In general, the more complex the setup procedure, the more powerful the program. The more sophisticated systems are structured like programming languages, with a set of linked commands that can be stored for repeat operation. For instance, one command might instruct the computer to retrieve the Employee file, another might get the address from the file, and another might calculate the gross earnings — all minor steps required to generate

even a small portion of the pay-check stub. With some DBMS products, this usually-arcane command structure is referred to as a "Data Manipulation Language" (DML).

There's almost no excuse for the esoteric quality of these data base "languages." One product goes so far as to call its built-in screen editor a "Screen Manipulation Language" (SML). In most cases, the language is a reflection of its creator's own private thought processes. Programmers tend to be secretive and introspective, with a time honored tendency to make even the simplest concepts seem as inscrutable and as lofty as possible. Why else call a look-up program a "dynamic query facility" — or a keystroke, an "interpretable console input character."

Regardless of the scope or complexity of a data base product, there are four basic components to evaluate:

#### 1. The Data Entry Form.

With the simplest type of "file manager" — for example, a mailing list program — the data entry form may come pre-designed. With more flexible products, the user can create his own on-screen display for entering data. A large measure of your satisfaction with the product will be derived from the simplicity of this operation. The better programs provide built-in screen editors with word processor-like features that let you create data entry forms right on the screen. Some very good products with less user sensitivity

require that you assemble instruction tables specifying what information you want displayed at various rows and columns on the monitor.

Try to match your own level of sophistication — and the demands of your application — to both the flexibility and simplicity of this important function.

## 2. File Creation

The simpler programs provide ready-to-use files. More sophisticated systems require the user to create a file that conforms with the records specified in the data entry form. The file must contain data fields for all the "blanks" in the form. Again, the specific procedure can range from the sublime to the ridiculous. Some programs create the fields — and the file — automatically as soon as the newly created data entry form has been stored. Others require you to construct a table giving each field a label, character length, and alpha or numeric attributes.

Besides evaluating a program's file creation routine, find out if a file structure can be modified once it's created. With many programs, the fields cannot be changed or supplemented without destroying all the records in the file. The better programs include safeguards and options for altering a file structure without affecting the contents. At a minimum, you should be able to create a new file and transfer the contents of an existing file to the newly created one. More powerful programs permit formulas or calcula-

tion tables to be entered with a file to perform computations on numeric entries.

## 3. Query Facility

The "query" routine simply looks up records stored on file. Here too, flexibility is the deciding variable. The simplest programs merely retrieve records by one or more field entries, then display the contents. For example, you might retrieve a record by a name, an account number, a zip code, or a remark. Most query facilities permit "browsing" — leafing one at a time through a data file to examine every record. The more flexible products can retrieve records within any specified range — for example, zip codes from 90000 to 92000, or names from BLUBBER to BOORISH. You should be able to edit any record retrieved at the time of query. Most programs permit the user to re-enter the record fields and change or type data directly from the keyboard.

## 4. The Report Generator

The report generator — or "output formatter" — organizes data into a meaningful format for display at the monitor or hard copy reproduction. With some simpler products, the formats are already designed. More flexible programs permit the user to design his own reports and specify calculations.

If you don't fancy working with a nonsensical Report Manipulation Language, you might look for a program with a friendly formatting routine. The

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more malleable systems that emulate programming languages can be used to develop highly specialized application programs with virtually unlimited computing power.

Remember: the simpler the program, the less flexible. If your needs are not terribly complicated and your file data can be simply organized, an inflexible but friendly file manager may be your

best bet. If you have a unique application with diverse reporting requirements — and you, or somebody you know, likes to dabble in program construction — go for one of the more powerful but esoteric data base management systems.

Once mastered, a good DBMS will be the best performing, most highly valued piece of software you own.

# Atari Data Base Software Comparison Chart

The following chart contrasts the file management attributes of several representative data base products (the list does not include all the products reviewed in this section). The table is designed for quick reference and is not intended to endorse any particular products.

Be aware that manufacturers

frequently change the characteristics of their software to meet shifting market patterns and evolving applications. We recommend that you consult the supplier's literature for current specifications on any given product, then update this chart accordingly.

## KEY

<b>TITLE</b>	Common or commercial trade name for the product	<b>CHR MAX</b>	Maximum character length per field
<b>REC MAX</b>	Maximum number of records in any given data file	<b>FLD SORT</b>	Sorting by any specified field
<b>FLD MAX</b>	Maximum number of fields per record	<b>SRCH SPD</b>	Search speed, rated on a scale from 1 to 10
		<b>COST</b>	Representative or suggested list price

<b>TITLE</b>	<b>REC MAX</b>	<b>FLD MAX</b>	<b>CHR MAX</b>	<b>FLD SORT</b>	<b>SRCH SPD</b>	<b>COST</b>
Data Perfect	511	32	696	•	8.0	\$129
File Fax	880	32	1K	—	9.0	\$130
File Manager 800+	2K	20	500	•	8.0	\$100
SynFile Plus	255	32	800	•	8.5	\$100

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## A Data Base Software Work Sheet

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### I. The Environment

A. Which term best describes the application?

- Organizational records
- Customer or membership records
- Employee records
- Inventory management
- Parts and price lists
- Mailing lists and labels
- Scientific records
- Library records
- Personal records
- Accounting/bookkeeping
- Automated instruction
- Financial reports
- Customer billing
- Checking account management
- Other: \_\_\_\_\_

B. How many records will have to be managed?

- Fewer than 200
- Between 200 and 500
- Between 500 and 1,000
- Between 1,000 and 2,500
- Between 2,500 and 5,000
- Between 5,000 and 10,000
- More than 10,000

C. What is the background of the person(s) who will set up the data base system?

- Little or no experience in computers or programming
- Some experience with a computer filing program
- Moderate experience with computers or programming
- Extensive computer experience, little programming experience
- Extensive experience in programming or application development with a data base system

- D. Which phrase best describes your industry or trade?
- A general business or occupation well served by existing application products
  - A specialized industry or trade with a moderate availability of software programs
  - An industry or trade that can be served by some existing products only with modification
  - An industry or trade for which existing application programs are few or none.
- E. What's the budget for the software purchase only?
- Less than \$150
  - Between \$150 and \$250
  - Between \$250 and \$500
  - Between \$500 and \$1000
  - Between \$1000 and \$1500
  - More than \$1500:

**II. The product (Name: \_\_\_\_\_ Producer: \_\_\_\_\_ )**

- A. Which phrase best describes the data base program?
- Electronic card file
  - General-purpose file manager
  - Industry-specific filing program
  - Flexible data base system
  - Application development system
- B. What is the level of sophistication required?
- Little or no computer background
  - Moderate computer background
  - Considerable computer experience and some programming training
  - Extensive programming skills
- C. How does the program generate data files, entry screens, and reports?
- None required: all items are pre-designed.
  - Easy to use screen editing format
  - Friendly but extensive quick generation routines
  - Specification and instruction tables
  - "Manipulation" languages
- D. The Components
1. Data Entry Form
    - Pre-designed, ready to use
    - Can be created with a built-in screen editor
    - Must be created with an add-on screen editor

- Must be specified in a table
- 2. Data Files
  - Already created and ready to use
  - Can be created with a file generator
  - Must be specified in a table
- 3. Field Attributes
  - Alpha or numeric attributes already set
  - Alpha or numeric, or both
  - Maximum field length already set
  - Variable field length
- 4. Query Facility
  - Browsing capability
  - Search by primary field only
  - Search by any field
  - Search by multiple fields
  - Edit any field       Add a new record
  - Delete any field       Delete entire record
- 5. File Reconstruction
  - Data file can be modified without destroying the contents.
  - Data file can be modified only by destroying the contents.
  - Data file can be modified by creating a new file and transferring the contents.
  - Data file cannot be modified and the contents cannot be transferred to any other file.
- 6. Report Generator
  - All reports are pre-designed and cannot be modified.
  - Pre-designed reports can be modified for my purposes.
  - Friendly, menu driven report generator
  - Calculation and procedure tables required
  - Overblown "Report Manipulation Language"
- 7. Product Cost
  - Less than \$150
  - Between \$150 and \$250
  - Between \$250 and \$500
  - Between \$500 and \$1000
  - Between \$1000 and \$1500
  - More than \$1500.

## Data Base/Report

Atari

*System Requirements:* 40K, disk  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$25

Atari's **Data Base/Report** system is a versatile data manager with excellent design flexibility and modest report generation. For uninitiated first timers, the program offers the ability to design custom file structures without having to master a plethora of esoteric command formats and attribute tables.

The user has nonspecific control over the content of each file. Fields can be created and labeled for any category of the operator's invention. Hence, you can construct a data base of video tape titles as easily as one for medical records. Names and addresses, membership data, parts lists — the applications are limited only by the user's imagination (and a few important quantitative restrictions).

The maximum size of any individual record is ten fields. In short, the information you store can consist of no more than ten separate categories. The record must be retrievable by a single "key" — a word that indexes each set of information. However, you can store more than a thousand records in most instances.

A front-end menu guides the user through subroutines for defining file specifications, adding records to the data base,

editing and deleting existing records. The menu also offers options for sorting and printing. You can designate specific ranges for printout based on minimum and maximum extrema. For example, you can sort records based on specific zip code ranges or letters of the alphabet. Be patient when you initiate a sort through a lengthy file; the speed is rather leisurely, and you'll be better off not watching your computer "worry."

The report generator is not nearly so flexible as the file creation facility. Your printouts will all be largely identical, and there's no easy way to alter the format. The most serious shortcoming is that the program prints each record field on a separate line, so it's impossible to create a simple manuscript index or summary listing with all the data contained in a single record arranged on a single line.

Atari users will appreciate the program's ease of operation and no-nonsense approach to a potentially harrowing activity. In light of its affordable price — less than \$25 — **Data Base/Record** is an outstanding value that accommodates a broad spectrum of common filing applications, both at home and on the job.

## Data Perfect

LJK

System Requirements: 48K, disk  
Ease of Implementation: 8.5  
Program Depth & Detail: 8.5  
Value for Your Money: 9.5  
Support Availability: 9.0

User Sophistication: Begin.  
Video Design & Clarity: 9.0  
Overall Efficiency: 9.0  
Documentation: 9.0  
Price: \$129 (with Letter Perfect word processor)

**Data Perfect** may not be perfect. But it's classy, friendly, and surprisingly flexible. On the surface, it's a basic file management program that searches and sorts user-defined files. On closer examination, you'll find this product to be an efficient merge module for its companion word processor, Letter Perfect.

This product offers freeform flexibility in the design of files, as well as the ability to create a custom screen display to serve as the "form" for entering data. **Data Perfect** combines the power of a big-system data base management program with the friendliness of a card file.

The user keys in labels for each record field, then adds data. A field can be alphanumeric or exclusively numeric. A year-month-day format can be specified for entering dates — or an accumulator format for storing results of calculations performed on other fields.

Records stored in any field can be merged with the word proc-

essor to create personalized correspondence, pharmaceutical records, collection letters, even accounting statements.

You can also design your own report format. Select only the fields you want to be printed, arrange them in any order, and specify calculations and results. Create your own invoice, statement, balance sheet, parts list, or mailing labels.

**Data Perfect** will sort through a data file by any specified parameter. The operator types a key word, and the program locates the first record meeting the stipulated condition or criterion. You can also select a range of records for printing — for example, addresses in a certain zip code range, or customers with outstanding balances over a specified amount.

Sleek, elegant, and friendly, this integrated system of word processor and flexible data manager is one of the most professional packages available for the Atari family.

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## File Fax

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TMQ

*System Requirements:* 48K, disk or cassette  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$130

**File Fax** is an exceptionally pliable file manager that can be adapted for a wide range of data base applications. It permits freeform definition and relatively large record sizes. Like the data base systems you'd find on larger and more costly hardware, this program can handle number crunching as well as simple filing. Using simple instructions, you can program the filing system to perform calculations on the data you enter, storing the results and displaying them in a custom report.

Your first task is defining a data file, creating fields for all the records you want to store. Each field is used to enter and store an item of information — for example, a name, account number, or dollar amount. A field holds alpha data (as in the case of a name or title) or numeric characters (e.g., a price or invoice total). Each record can consist of as many as 31 different fields, but is limited to one screen "page." You can instruct **File Fax** to sum any specified group of numeric fields and store the total in a results field.

Once you've defined the file, you simply key information into the record fields. If you've in-

dicated totaling and subtotaling, **File Fax** will compute the sums and enter the results in the appropriate fields. You can retrieve a record by any individual field, designating a single file or a range. **File Fax** permits the use of logical operators to retrieve records by specified condition. For example, you could retrieve the records of customers who owe you more than \$200, or who reside in zip code areas between 60000 and 68000. The program can sort by up to eight criteria at once.

**File Fax** has an integral report generator that helps you customize your own printouts — invoices, accounting statements, summary listings, or customer lists. You supply the names of the fields you want to summarize, the calculations you want performed, and the order in which you want the records printed.

Though sophisticated, this product is supported by a front-end tutorial and an ample selection of on-line "Help" screens. Overall, this is one of the most flexible filing systems available for Atari computers, especially useful for applications involving retrieval and interpretation of numeric data.

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## File It

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*Swiftly*

*System Requirements:* 16K, cassette  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.5  
*Price:* \$20

This cassette-based file manager from Swiftly Software permits custom definition of the format under which records are stored. Moreover, it's a simple, menu-driven program that requires some understanding of data base concepts but no prior experience in programming.

With this program, file capacity and speed of sorting are primarily functions of your computer's main memory. The larger the RAM, the better **File It** will perform. Though the program will boot and operate in a 16K environment, we recommend at least 32K to handle common file applications.

A concise menu and simple prompts guide the user through the file creation procedure — designating fields, creating labels, and stipulating the type of data. The file format can be recalled as an on-screen form for adding records and editing the data contained in existing records.

You can search through the data base for a specific record

based on the information contained in any field. Let's say you're loading the entire contents of your "little black book" into a computer data file. Your format might consist of fields for NAME, PHONE, HAIR color, EYE color, and a one-to-five-star RATING. Once you've keyed in the specifications for every person in your book, **File It** will give you instant access to any profile at the touch of a key. For instance, by specifying PURPLE in the HAIR field, you can retrieve the phone number of that eccentric punk rocker you met at a party last October — or, by keying "5" into the RATING field, relive the hottest date you've ever had.

Of course, **File It** can also be used to store other phone numbers, customer lists, payment addresses, parts inventories, and archives of books, tapes, or records. Retrieved records and summaries can be displayed on your monitor or TV, or sent to the printer for hard copy reproduction.

# File Manager 800+

## Synapse

*System Requirements:* 32K, disk or cassette  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$100

This flexible electronic filing cabinet can be modified for custom applications, permitting the design of entry formats and tailoring of printed reports. Designed for ease of use, this program offers exceptional plasticity at a relatively modest price. The novice should be forewarned that an understanding of software development concepts may be required to derive full advantage from **File Manager's** pliable design features.

The program is based on conventional office filing concepts: your data base consists of several files in which individual records are stored. **File Manager** adds the ability to retrieve a particular record by looking up any of the information contained on file, sorting records in alphabetical order or in any numeric sequence.

The user creates a file structure by supplying labels for each information field. You can utilize the full space of the monitor screen for data entry — to a maximum of 2000 characters, either alpha or numeric. When you add data to your information pool, you simply type into your record fields, just as you'd complete a blank form with a typewriter. **File Manager** lets you position the

cursor in any field on the screen as if you were editing a document — letting you enter data in any sequence, or re-enter corrections prior to saving the record.

Your information can be retrieved by any criterion: enter a key word for any of the fields, and **File Manager** will search through the file until it finds the first record meeting your specified condition. You can combine field specifications to further isolate retrieval. For example, let's say you've created a data base of runners in your jogging club. In each record, you've indicated a runner's name, number of miles jogged, and brand of running shoe worn. You can simply retrieve any record by name or shoe; but, by combining field keys, you can also retrieve only the records of runners who have logged 200 miles and wear Kangaroo brand sneakers (no endorsement intended).

One of **File Manager's** notable strengths is its ability to perform calculations on data entered into individual records. In our example, the program could store all of each runner's mileage for several events, and place the sum in a separate "Total" field. Besides results of calculations, a

math field can also contain a constant (e.g., a shoe size), or a dollar amount (with a floating decimal to divide dollars from cents).

**File Manager 800+** is menu-driven and supported by an amusing mixture of sound and color.

## SynFile Plus

Synapse

*System Requirements:* 48K; disk drive  
*Ease of Implementation:* 9.0  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.5

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$100

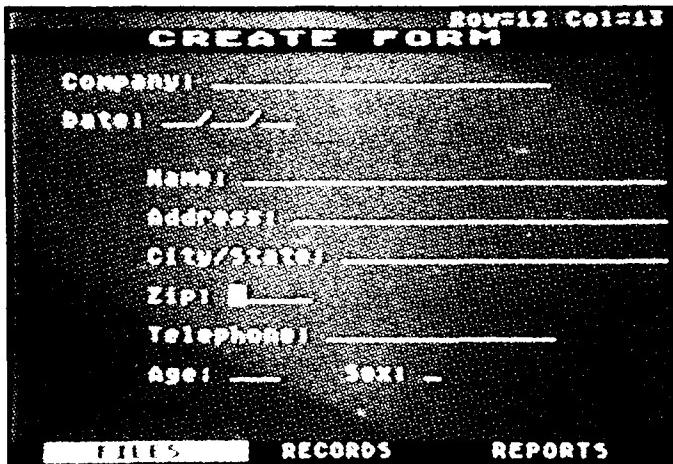
**SynFile Plus** is a straightforward data base management system with exceptional flexibility for custom storage/retrieval applications. The program has several features reminiscent of the data base systems found on larger commercial hardware — including custom form design, a menu-driven query facility, and comprehensive listing capabilities.

The operator selects desired functions from a simple, front-end menu, with options to open a data file for browsing, list the contents of a file by specified order or range, and create an on-screen form for data entry.

The first step is to define the entry form. The operator simply keys in labels for various record fields in any desired position on the monitor, supplying blank lines for the recording of data earmarked for storage. The same screen editor is used to design

reports. No esoteric "languages" or cumbersome procedure tables are required — simply the arrangement of text on the monitor screen according to any desired design scheme.

When files are created, their names appear automatically on a directory. To open a file, the operator simply moves the cursor bar to the desired title. A single



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file can span as many as 16 floppy disks with up to 66 fields in each record. Record fields can consist of alpha or numeric characters, including computed results from calculations performed on other fields. A date format permits the entry of calendar information to be restricted to a Day-Month-Year field. **SynFile** also permits use of cumulative and conditional fields for more

complex calculations and reports.

This is a good program for sales management, inventory control, customer lists, and simple invoicing applications. It has enough power and capacity to generate financial statements, checkbook registers, or price lists. Friendly but flexible, easy yet structured, **SynFile Plus** may well be the best data base software value on the Atari market.

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## Business

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*"In veins of mountains, under building bases  
Coined and uncoined, there's gold in many places.  
Who, you ask, will bring it to the light?  
Man endowed with Mind's and Nature's might."*

*Goethe*



## How to Evaluate Canned Business Software

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Barry was promoted to marketing director of a major supplier of medical/dental software because of his familiarity with the profession. He'd spent nearly a decade on the road peddling pharmaceuticals and instruments to independent practices, multi-practitioner clinics, and hospital supply centers.

He knew what it took to influence physicians, and he definitely had his own ideas about advertising. Too many companies sold medical software: it was almost impossible to distinguish one product from another.

It was Barry's idea to run a full-page ad in a leading medical journal. The piece would stress the **benefits** of the software package, rather than its name or application. After all, there must be fifty products on the market that have "Patient Billing" in their names. The company's advertising agency laid out a tasteful, very disciplined ad with plenty of white space and the producer's logo prominently reproduced at the bottom. In extra-bold type, the headline read: "We sell solutions."

Within a week after the magazine hit the mail, Barry opened his first letter from an inquiring physician. Hastily scribbled on a folded sheet of note paper was the request: "Please send info re your chemical

solvents," followed by the doctor's signature.

Despite its clever intentions, Barry's software ad clearly missed the mark. Often the product itself is just as alien to its intended application. The nuances of marketing make it necessary to produce highly generic, relatively inflexible application programs that appeal to the lowest common denominator in the marketplace.

It's often said that with a canned software product, you've got to adapt your business to the program, rather than the other way around. To an extent, that's true. But often, the process of gathering and organizing data to make the transition from manual methods to automation is by itself a positive influence on the business. Automation forces organization. You'll have to look at information and events in a more highly structured way, view their inter-relationships perhaps for the first time, and segregate minute details of your business into neat, accessible categories.

But a product that requires more adaptation than you can profitably manage — or fails to provide for certain operational details that are crucial to your business — is ultimately useless to you.

Consider, for example, the case of the canned accounting program. Many such programs come with a ready-made chart of accounts complete with pre-defined, five-digit account numbers. Now, if you've never had a chart of accounts before, you might find

this feature a wonderful convenience, alleviating you of the time consuming burden of inventing codes and descriptions for all your income and expense categories. On the other hand, if your company is operating under a government contract that requires periodic auditing of accounts based on a specified, nine-digit code, you're in trouble.

As with data base software, the simpler a canned program is to use, the less flexible it's likely to be.

Unfortunately, there is no standard set of evaluation criteria for application software. You'll have to judge each program independently based on its compatibility with your own unique mixture of processes, people, budget and industry or trade. Aside from the measures discussed in other chapters of this book, you should also consider the following variables.

#### **Modification ability**

All in all, it's far better to fit the system to your business, than to mold your entire environment to the rigid requirements of an inflexible software package. Can the program be modified at all? And if so, how? Will you have to hire a bit banging program expert to make even small adjustments? The best application programs have built-in utility programs that allow the user to make minor modifications. For example, a good accounting package will provide utilities for conforming

the system to your own fiscal year, changing entry headings (e.g., "Item" to "Service"), and adding remarks to invoices.

Often, a program cannot be modified without its "source code." Some producers supply the code free of charge, others offer it as an optional purchase. The more paranoid software houses guard their source codes like a social disease.

### User adaptability

Select a program that suits the behavioral qualities of the people who will use it on a day-to-day basis. The product should be neither too sophisticated nor too simplistic. A friendly, menu-driven program is ideal for the uninitiated, first time user, but can aggravate an experienced user more interested in speed of execution than on-screen chit chat.

On one side of the coin, menus are easy to operate. The user simply selects an activity from a list, usually by pressing an alpha or number key. The idea is to eliminate the need for multi-stroke commands and memorized formats. On the opposite side,

menus are time consuming and take up space in the computer's memory. In the time it takes to load a menu, receive your selection, find the program, then load and run it, the computer could already have crunched a few hundred thousand numbers.

Weigh the nuisance of lost efficiency versus the benefit of ease of operation.

### Existing resources

Consider your present level of know how and personnel. Will the product require additional knowledge or staff to adequately operate? It may be a minor challenge to learn a critical path scheduling program even if you know nothing about PERT methodology. But if you take on a sophisticated ledger system, will you have to hire someone familiar with profitability accounting methods? In any industry, preference is given to products which ideally complement, not detract from, existing facilities. Keep in mind: the whole idea of buying a canned solution is to simplify your life, not complicate it.

## Back to Basics

Peachtree

*System Requirements:* 48K, 2 disk drives  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.5

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$195

Refreshing in simplicity, elegant in scope, **Back to Basics** is an easily mastered, elementary bookkeeping system for the very small business or self-employed individual. This product focuses specifically on the needs of the entrepreneur whose business is neither large enough nor complex enough to warrant a sophisticated accounting package, but at the same time is too elaborate for a checkbook-oriented finance program.

Easy to use bookkeeping programs are Peachtree Software's bread and butter product line, and this package is perhaps the most clearly defined and most accurately targeted offering the company has introduced to date. Whereas other Peachtree accounting software tends to suffer for its simplicity, **Back to Basics** draws its primary strength from it.

The package consists of only three essential modules — GL, AR, and AP — disdaining payroll and inventory routines in the interest of catering to the small time operator. This fact alone establishes the product's market posture. Service-intensive businesses with few or no employees are unquestionably the most likely to derive satisfactory results.

### General Ledger

The GL module is available as a standalone unit or as the core of an integrated bookkeeping system. This modest ledger program provides a Cash Disbursements Journal for entering expense transactions, a Cash Receipts Journal for recording income, a Cash Sales Journal for retail transactions, and a General Journal that accommodates other, miscellaneous entries.

All entries are made with a simplified journal format that resembles a printed invoice or purchase order. The beauty of the system is its "lay" orientation; **Back to Basics** "speaks" plain English, not "CPA." You won't have to complete a graduate course in corporate accounting in order to understand what numbers you're supposed to enter in what categories.

The Cash Sales Journal is organized for businesses with itemizing cash registers. There's no way of tying the software to an electronic cash drawer, so you'll have to re-enter your cash transactions manually from the register tapes to the computer. Obviously, this process becomes largely unfeasible unless you have

a cash register that totals each day's sales by department and category.

The GL module is equipped with a pre-defined chart of accounts that can be edited to the user's own specifications. The account format is somewhat rigid, with only four digits per account number. Moreover, the first digit is preset and cannot be altered. For example, all accounts related to assets must begin with the number "1."

System output includes financial statements, income statements, and journal summaries.

### Accounts Receivable

The AR module generates customer statements and records the transaction for automatic posting to the general ledger. The operator has the option of printing statements on ordinary letterhead or pre-printed invoice forms.

This program has some nice touches that add a professional flavor to an otherwise rudimentary record keeping system. One is an option for automatically in-

serting messages on printed statements as an account becomes past due. Another is a provision for credit arrangements with ten different scales.

**Back to Basics** AR also maintains a master file of customer data, from which billing information is extracted at the time of statement generation. Besides customer statements, the program generates a summary of active accounts, a detailed transaction listing, and address labels.

### Accounts Payable

The AP module includes a master vendor file, transaction journal, open invoice register, and purchases journal. The operator invokes the "transaction" routine to post invoice totals to the system for payment. Payment terms and vendor information is automatically extracted from the file.

The program prints listings of vendors, a summary report on past due invoices, and a print-out of purchasing activity and adjustments.

## The Bookkeeper

*Atari*

*System Requirements:* 48K, disk, Atari BASIC  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.0  
*Support Availability:* 9.0

Atari's "name-brand" bookkeeping software is deceptively named. **The Bookkeeper** is actually a limited-function ledger system, not a full-fledged business accounting system, as you might surmise. The core of the program is a procedure for manually entering accounts receivable and accounts payable transactions. System output includes standard business financial statements in a conventional format — viz., a P&L and balance sheet.

The program derives its name from additional summary reports on accounts receivable transactions and accounts payable activity. However, this product does not provide separate disk modules for these purposes, nor generate sales analyses or age accounts.

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 8.0  
*Price:* \$150

The best thing about Atari's **The Bookkeeper** is its vivid use of color in a cellular motif. In fact, the sizzling background colors — were they not visually distracting from the task at hand — would be attractions in themselves. Like the pages in a catalog, entry screens are keyed by color to specific activities.

To operate this program, you'll first need to boot Atari BASIC. Posting data to the on-screen forms is a simple chore requiring virtually no exposure to programming but more than a little background in ledger accounting. The speed of processing is much slower; plan to take a coffee break, remove your nail polish, or read a few reviews from this book when **The Bookkeeper** gets ready to do its thing.

## Bookkeeper

*Matrix*

*System Requirements:* 48K, MBASIC, disk  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.0  
*Price:* \$1000

Perhaps the most obvious oversight of Atari software producers is the fact that a properly equipped Atari system has as much power, capacity, and efficiency as most any single-user microcomputer on the market. Testimony to this curious phenomenon is a decided lack of business and professional software to take full advantage of the system's processing capabilities. **Bookkeeper** from Matrix Software of Big Rapids, Michigan is a sterling exception.

This set of four interactive accounting modules provides a fully integrated business bookkeeping system capable of handling the needs of a broad installation base of small business operators. Like similar products for the Apple IIe and IBM PC, this product will appeal most strongly to at-home business operators with relatively small account burdens but a need for full-function accounting.

**Bookkeeper** consists of four modules for general ledger, accounts receivable, payroll, and accounts payable. The chart of accounts can consist of up to 375 income and expense accounts distributed over ten departments. The GL module produces income statements by department, as well as a consolidated operating statement by month or year-to-date. A budget report displays variances of actual income and expense items with initial forecasts. The program also generates trial balances, profit-and-loss state-

ments and balance sheets on a system-wide or departmental basis.

The AR module accommodates a maximum of 100 accounts. The operator keys transactions into an on-screen cash receipts journal similar to a manual bookkeeping form. The program produces invoices and receipts, calculating all extensions, subtotals, tax amounts, and totals automatically.

As many as a hundred employees can be maintained in the payroll system, with federal, state, and local taxes automatically computed and withheld from paychecks. The payables program can handle a maximum of 100 vendors.

**Bookkeeper** has the appearance and flow of a "big-system" accounting program. The screen displays and reports mimick the kind of software you'd find on a timesharing mainframe system or at an accounting service bureau. This cosmetic professionalism gives the program exceptional appeal to the small business operator seeking an all-purpose administrative tool capable of handling invoices, payables, and payroll. Written in BASIC, the program executes slowly, especially in generating financial reports from freshly entered data. Ambitious in design, admirable in scope, Matrix Software's **Bookkeeper** may well be the most professional software product with a business application available for Atari computers.

## SynChron

### Synapse

*System Requirements:* 48K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$50

**SynChron** is a simple electronic scheduler based on a graphic calendar display. The program offers easy entry, vivid graphics, and a limited data base capability to support personal scheduling objectives.

To enter an appointment, the operator displays the **SynChron** calendar for any specified time period, then scrolls through the dates to locate the desired frame. With the cursor positioned on the appropriate date, you key in the specifics — name, place, hour, etc.

Any entry can be retrieved by date or, optionally, by a key word for a particular event. For instance, you can retrieve a specific birthday, ballgame, or gala affair simply by typing the key word.

**SynChron** is a very simple program with little elaboration — a combination card file and wall calendar adapted for the keyboard. Pragmatists may question this product's value in relation to its price, but it's a nice bit of everyday automation for the starry-eyed computerist.

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## **Education**

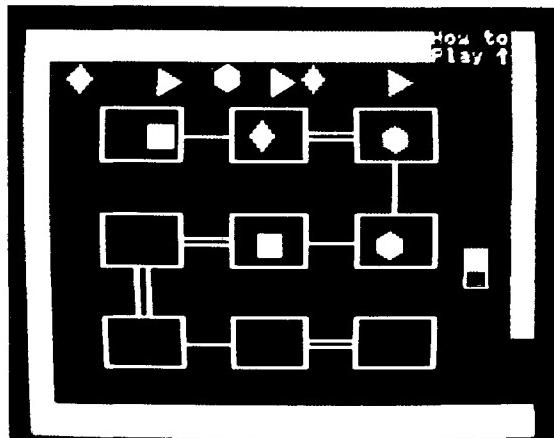
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*“There’s nothing wrong with the American education system that can’t be cured by the impregnation of a few geniuses.”*

*Thomas Dewey*



Wizard of Words — Opportunities For Learning, Inc.



Gertrude's Secrets — The Learning Company

## How to Evaluate Educational Software

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Like loving and buying, learning is a type of behavior, subject to modification by the selective use of stimuli. Visualize learning behavior as a series of stimulus-response associations. Every sentence a child reads, every map, picture, and arithmetic problem — all stimulate responses of some kind or another. We can evaluate learning in part by the types of responses the student exhibits. The challenge of instruction is to optimize learning conditions to reinforce positive response.

The use of computers in education is not new. Large mainframe systems have been applied to instructional objectives by the government and military since the late 1940s. Well financed corporations like the late, great Bell Telephone system are acknowledged pioneers in the field of computer-assisted instruction (CAI). Computer models have been used to train pilots, technicians, health care professionals, and executives. But until the current decade, the skills and expense of developing autotutorial systems was beyond the reach of all but the largest business entities and governmental branches.

With the introduction of the microcomputer, the size and cost of computing fell dramatically — and with it, the elusiveness of objective-based, programmed instruction for the masses.

Autotutorial instruction actually

only accounts for about a third of the commercial software targeted to the educational markets. Learning games that combine video action themes with fast-paced exercise drills have gained a permanent stronghold in the classroom as well. A third category of instructional programs encompasses a broad spectrum free-form "electronic workbooks" that complement bookish discussions with semi-animated illustrations. Of course, in many cases the distinction between the three groups is marginal.

### Autotutorial Architectures

In serious programmed instruction, the subject matter is divided into tiny atoms of information ("frames"). The learner must successfully demonstrate mastery of each frame before he can advance to another. The frames are designed in an ascending progression of complexity and scope. Psychological conditioning techniques are used to reinforce behavior and optimize exposure to new information. Programmed instruction modules always have specific behavioral objectives ("terminal behaviors"). Learning is evaluated with specific measures based on the terminal behavior.

"Operant" techniques reward the learner for behavior indicative of the desired ultimate behavior. On the opposite side of the coin, the student is never "punished"

for failure. The computer instead branches to an in-depth subroutine that reinforces the frame with simpler, perhaps more elaborate concepts.

Consider, for example, a program that aims to teach elementary graph plotting. The terminal behavior would be defined as the ability to plot a single point anywhere on a simple graph. Learning would be measured by supplying the student with two coordinates (x,y) to plot on a sheet of graph paper.

The first frame would teach the concept of positive and negative integers. The second would create recognition of the underlying concepts in construction of a graph. A third frame would teach the coordinate system. Finally, the student would receive exercise in plotting various coordinates. In each frame, the student is tested for his proficiency in the subject matter to date. If performance fails to demonstrate mastery, the computer branches to a review or reinforcement.

As you can easily visualize, a complete instructional program can consist of thousands of frames and several more times as many branches.

Empirical evidence suggests that this progressive autotutorial architecture is the most effective kind of computer-assisted instruction. A good programmed instruction module will generally take less time to teach more information, with better retention over time.

A CAI program should be self-paced, self-developing, self-reinforcing, and self-testing.

### **Learning Games**

A natural offspring of microcomputers in the classroom was the development of practice drills in various subject matters cloaked as video action games.

By and large these programs are merely electronic flash cards, creating random exercises for individual response. Still, the computer adds two important ingredients to the learning situation. First, most drills can be customized by the instructor. The pace can be altered, the content supplemented, and the level of difficulty advanced. Second, the action game supplies motivation. Let's face it: children like to play, and the combination of study and play in a controlled, interactive environment is an ideal fusion.

### **Electronic Workbooks**

Most educational software merely translates workbooks onto a computer screen. Computerization adds the advantages of self-correction of review quizzes, individualized pacing, and animated diagrams.

Unfortunately, computer graphics are not nearly as lucid as printed illustrations or audio-visual presentations. Look for programs that use animation to demonstrate active phenomena. The best software in this category will portray planetary orbits, anatomical systems, DNA replication, and graphic math equations in vivid animation.

Since individual aptitudes and cultural experiences vary greatly from one child to another, select programs with enough flexibility to bridge several grade levels. To accomplish this diversity, some programs have built-in, optional difficulty levels. Others provide for customization by the instructor. For example, a good vocabulary builder will select words from a master list based on the level of difficulty you specify. The best programs in this category let you add words to the dictionary.

As with other software, the relationship between price and performance is a proper ingredient in the purchasing decision. Compare programs with similar objectives and scope. Judge whether or not a product is comparably priced with — or higher or lower than — others in its performance range.

# Computer Learning Work Sheet

---

Subject: \_\_\_\_\_

Grade Level(s): \_\_\_\_\_

Age group(s): \_\_\_\_\_

Author: \_\_\_\_\_

Credentials: \_\_\_\_\_

Program design:

- |   |   |
|---|---|
| <input type="checkbox"/> Programmed instruction | <input type="checkbox"/> Exercise drill           |
| <input type="checkbox"/> Learning game          | <input type="checkbox"/> Review test              |
| <input type="checkbox"/> Electronic workbook    | <input type="checkbox"/> Audiovisual presentation |

Degree of interaction:

- |   |  |
|---|--|
| <input type="checkbox"/> Highly Interactive     | Student must respond to every frame before the program proceeds. |
| <input type="checkbox"/> Moderately Interactive | Frequent responses required to complete the program.             |
| <input type="checkbox"/> Fairly Interactive     | Few responses required in the program.                           |
| <input type="checkbox"/> Hardly Interactive     | Program is self-administering without student response.          |

Type of reinforcement:

- |   |
|---|
| <input type="checkbox"/> Answers corrected and explained            |
| <input type="checkbox"/> Student praised for correct answer         |
| <input type="checkbox"/> Game or video event rewards correct answer |
| <input type="checkbox"/> Student chastised for incorrect answer     |

Level of difficulty:

- |  |
|--|
| <input type="checkbox"/> Adjustable to several levels      |
| <input type="checkbox"/> Adjustable to a few levels        |
| <input type="checkbox"/> Adjustable to two or three levels |
| <input type="checkbox"/> Fixed                             |

Content flexibility:

- |  |
|--|
| <input type="checkbox"/> Content can be added to or modified as needed |
| <input type="checkbox"/> Content can be modified a little              |
| <input type="checkbox"/> Content cannot be modified                    |

Average program length: \_\_\_\_\_ Min.

Specific content areas:

- |          |          |
|----------|----------|
| A. _____ | E. _____ |
| B. _____ | F. _____ |
| C. _____ | G. _____ |
| D. _____ | H. _____ |

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Supervision:

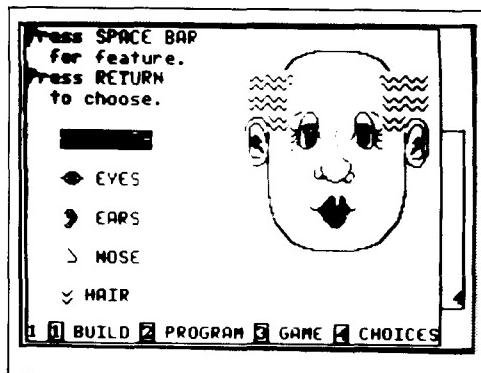
- Requires little or no supervision
- Requires some monitoring of progress
- Requires considerable supervision
- Cannot be administered without supervision

Reporting:

- Stores student performance; generates analyses
- Stores student performance; no printouts
- Stores student scores only
- Does not store any data.

## Early Learning Skills

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Facemaker — Opportunities For Learning, Inc.

**ABCs**

JMH

*System Requirements:* 16K, cartridge  
*Program Depth & Detail:* 6.5  
*Value for Your Money:* 7.5  
*Support Availability:* 7.0

*Video Design & Clarity:* 7.0  
*Overall Efficiency:* 6.5  
*Documentation:* 5.0  
*Price:* \$10

This electronic alphabet primer offers an abbreviated exercise drill for your youngest keyboard banger. The most challenging attribute to this concise tutorial is administering it to your restless rug wrangler, who invariably will be more interested in mashing all the keys at once with both fists than in poking out the character called for by the computer.

With close supervision and a strong heart, you can help your child complete the ABCs on the

monitor screen. The computer will display an excerpt from the alphabet (in alphabetical order, of course) with a single letter omitted. It's up to you to remember which letter belongs in the space — or, if you can't figure it out, to have your curtain crawler type the answer on your behalf.

Besides this thought-provoking challenge, **ABCs** also offers practice in associating big letters with little ones.

**Adventures of Oswald**

Program Design

*System Requirements:* 24K, disk; 16K, cassette; joystick  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$20

This software package is accompanied by an audio cassette to provide a complete, interactive, audiovisual experience. The narrator on tape describes the travail of Oswald, a little boy presumably much like the listener. Like Alice in Lookinglass Land, Oswald winds up in the

dark end of a mysterious tunnel. The player has to maneuver the cartoon Oswald up ladders and across platforms through adept joystick manipulation. The story is appended by a self-contained action game for early learners. The object is to help Oswald reach a golden key to escape

from a haunted chamber.

**Oswald** manifests an imaginative application of instructional media — a captivating mixture that supplements computer interactivity with audio in-

put for the young reader who might otherwise be left out of the experience.

This program is suitable for children from ages three to six.

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## Alphabet Zoo

*Spinnaker*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 7.0  
*Price:* \$29

The creatures confined in the **Alphabet Zoo** are (what did you expect?) the letters of the alphabet. That is, they **used** to be confined there, until **you** sprang 'em loose! Now you've got to chase 'em down to match the illustrations overhead. But can you find your way through the maze in time?

It's a world gone mad, a zoo of rampant alphabet characters and psychedelic colors. It's a word association and spelling game with unpredictable results.

It's **Alphabet Zoo**, a thoroughly entertaining learning game with a curiously charming design. Slick, fast, and funny, it's for children from three to eight.

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## Bumblebee

*Creative Software*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$35

This early learning game introduces six year olds to beginning concepts of computer programming.

Bartholomew, or Bart as he is known to his friends, is a very busy bee. The player gives Bart instructions enabling him to buzz from flower to flower collecting pollen points. Bart's flight must be carefully planned to keep him from impending danger.

A very nasty lady known as

Olga the evil garden spider is poised for Bart to make a mistake and get tangled in her web. Ol' Bart has to keep clear of walls too.

If Bart manages to make it back to the beehive in one piece the screen lights up in a colorful graphic display. The player can vary the level of difficulty to require more intricate flight patterns.

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## Face Flash

Milliken

**System Requirements:** 16K, cartridge  
**Program Depth & Detail:** 4.5  
**Value for Your Money:** 6.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 7.5  
**Overall Efficiency:** 6.5  
**Documentation:** 7.0  
**Price:** \$17

If you've been looking for this program under the name "Flash Face," this is probably the product you had in mind. But don't be embarrassed: for some reason, more people request this popular counting game under that title than under its real name. By any name, "Flash Face/Face Flash" is exceptionally popular with grade school teachers looking for at-home conditioning tools for their own children.

It's a simple program with a singular focus, relying on visual discrimination and repetition. The "game" displays a random number of happy faces. Each player must correctly compute the number of smiles within a set amount of time. As the game progresses, the "flashes" become increasingly more abrupt, requiring quicker counting and an attentive memory.

## Facemaker

*Opportunities For Learning, Inc.*

<i>System Requirements:</i> 48K, disk	<i>Video Design &amp; Clarity:</i> 8.5
<i>Program Depth &amp; Detail:</i> 7.0	<i>Overall Efficiency:</i> 8.0
<i>Value for Your Money:</i> 8.5	<i>Documentation:</i> 8.5
<i>Support Availability:</i> 8.0	<i>Price:</i> \$40

**Facemaker** is a computerized "potato head" for children ages from four to eight. Color graphics and sound add to the child's enjoyment of creating any face of his or her fancy. The disk includes three facemaking games. In the first, the player adds eyes, nose, mouth, etc. onto a blank face displayed on the monitor screen. The results can be hilarious — or merely bizarre.

The second game challenges the child to make the face smile, frown, wink, and move its ears in response to simple keyboard com-

mands. The idea is to provide practical exercise in keyboard entry with graphic, real-time results.

The final episode is an association and memory game. The player examines a pre-designed face, then tries to re-construct it from fragmented mouths, ears, eyes, brows, and noses.

**Facemaker** is good, clean fun that exercises the early learner's concentration, attention to detail, and multiple-item distinction. With a more verbally fluent child, the games may wear thin after a few plays.

## Gertrude's Secrets

*The Learning Company*

<i>System Requirements:</i> 48K, disk	<i>Video Design &amp; Clarity:</i> 8.0
<i>Program Depth &amp; Detail:</i> 8.0	<i>Overall Efficiency:</i> 8.0
<i>Value for Your Money:</i> 8.0	<i>Documentation:</i> 8.5
<i>Support Availability:</i> 8.0	<i>Price:</i> \$45

Gertrude the Goose likes to fly in with treasure. Her house is a maze of puzzle rooms, but you can only see one at a time. She's got three secrets for you to guess in her room in the very middle of the house. Which object fits in

the box? "If it belongs, it will stay," Gertrude reminds, "If it doesn't, it will drop out." How can you load a train so that the cargo in every car is different? "One line! One difference!" hints Gertrude. Can you guess what

colors and shapes will complete her array?

Solve one of Gertrude's puzzles, and in she soars with new treasure for your treasure room. Sound easy? Look out! Gertrude's secrets are different every time!

One of the most popular early learning games ever devised, **Gertrude's Secrets** is a simple random exercise in rudimentary logic. The child must distinguish between basic colors and shapes — triangles, cubes, hexagons, diamonds, then solve Gertrude's puzzle using visual association.

In the "train" game, the child must load 16 boxes each with a different shape and color. No two

contiguous boxes can have the same combination. In Gertrude's "array" game, her secret is a logical series that the child must construct from a beginning pattern.

The graphic design is elementary but appealing. Gertrude herself is a delightful, swan-like character that even adults find irresistible. The resolution is a little weak, but the symbols and shapes portrayed are so basic there's little problem distinguishing them.

This program uses an operant technique that rewards positive behavior but never chastises for mistakes. The game is suitable for ages three to six.

## Hey Diddle Diddle

*Spinnaker*

*System Requirements:* 32K, disk

*Program Depth & Detail:* 8.5

*Value for Your Money:* 8.5

*Support Availability:* 7.5

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 7.5

*Documentation:* 8.0

\$30

Thirty classic nursery rhymes entertain children as they learn beginning reading skills. A simple and imaginative format, beautifully enhanced with colorful graphics and charming music, creates a sense of fantasy and fun to be enjoyed by children three to ten years old.

Three sections of **Hey Diddle Diddle** approach learning on dif-

ferent skill levels. "Storytime" continuously displays the thirty nursery rhymes with excellent pictures, music, and corresponding words for youngsters' enjoyment. "Storybook" does each rhyme in slow motion, giving children a chance to read along with the picture. Similar to the experience of having a story read, this exercise is an excellent pre-reading

demonstration of how words go together to form sentences or phrases. "Rhymegame" offers two levels of play. Children choose to unscramble words to make the phrases of a nursery rhyme — either four lines at a time or eight. They can compete against the clock or the attempts

of another player.

A low pressured, charming program especially suitable for youngsters age three to six, **Hey Diddle Diddle** allows children to become more familiar with words in an enjoyable and comfortable framework.

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## Hickory Dickory

Atari

*System Requirements:* 16K, cassette; 24K, disk;  
Atari BASIC  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.0  
*Price:* \$16

**Hickory Dickory** is a time tutorial focusing on the conventional clock face. Engaging graphics illustrate an antique clock with hands, challenging the child to read the correct time. The pupil supplies his selection by keyboard or joystick input.

The program is divided into several segments, each exercising a specific time interval. For example, one segment will test only times that fall on the hour; another portrays times falling at a quarter hour. You can also select

five or ten minute intervals — or a freeform tutorial that will depict any time at all.

A correct answer results in a congratulatory message. An incorrect response will prompt the computer or offer a hint.

**Hickory Dickory** is a vivid program with outstanding flexibility and scope. Its validation lies in the mere fact that it's one of the most popular kindergarten programs available for Atari computers.

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## Hidden Words

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T.H.E.S.I.S

*System Requirements:* 24K, cassette; joystick  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 7.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 9.0  
*Price:* \$20 cassette

What makes this word search program valuable is its versatility. It comes with a word base of the most commonly misspelled words and is adaptable to any SB Data Tape, making it appropriate for a wide grade range (1-8).

Word search games are among the best motivators for intermediate spellers. In this version, the hidden word is written on the bottom of the screen with a grid of jumbled letters above. The

child searches for the word, either vertically, horizontally, or diagonally; left, right, up, or down. The student's search is timed and scored by the computer.

**Hidden Words** offers large legible letters, with full color graphics and four levels of play. It's a good tool reinforcing spelling and word recognition skills garnered from other sources of instruction or study.

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## Hodge Podge

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Artworx

*System Requirements:* 32K, disk or cassette  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$15 cassette  
\$20 disk

This is a unique introductory program designed for children ages 18 months to 7 years with minimal adult supervision. In **Hodge Podge**, the child experiments with the computer keyboard in a very individual manner to discover music, colorful animation, and graphics. It's not really much of a "hodge

podge," at all, but rather a concise set of three interactive keyboard programs. The most involved tutorial incorporates all of the letter keys. When a key is struck, the corresponding character is displayed on the monitor screen, accompanied by a cartoon image of something that starts with that letter, and a

little harmonic melody somehow associated with the letter and picture. For example, when the child depresses "K", a koala bear appears on the screen above an oversized character, while the computer performs a rousing rendition of "Waltzing Matilda."

This is a versatile program in that it presents a learning experience of different emphasis for children in different age groups (e.g. visual transferal, memory, and beginning letter recognition for pre-schoolers; reading and spelling skills for early gradeschool children). Unfortunately, the graphic selection leaves something to be desired; most of the images are unclear, confusing, or not well associated with the corresponding character.

A separate tutorial explores the use of the number keys. Depress-

ing any numeric key from one through nine will invoke a "do-re-mi" representation of the musical scale, complete with a graphic drawing of the note, the written sound below (e.g. "fa"), and, of course, the sound of the note. The "0" key will play the whole scale to accompany graphic depiction on the monitor.

Four keys have been defined specifically to add interest for older children — the "arrow" keys, the "slash key", and the "space bar". Depressing one of these will cause graphics to be displayed over the image already on the machine. Older children may find this feature amusing, but a younger student is more apt to create havoc.

In all, this is an engaging program with sound tutorial value for early learners.

## I'm Different

Atari

*System Requirements:* 32K disk; joystick; Atari Pilot  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.0  
*Price:* \$25

In this visual discrimination drill, it's not the child who's "different" it's one of the colored shapes depicted on the monitor screen. In fact, the dazzling colors and ample sound effects are the best things about

this popular early learning game.

The exercise mimicks the visual discrimination problems found in standard IQ tests. The computer displays an array of similar shapes for the youngster to examine. All but one are identical. The child

uses the joystick to point to the shape that's different from the rest. A correct selection is "rewarded" with a musical concert and psychedelic light show.

The program is designed for use with close supervision. The

cursor etches a path on the screen as it moves from shape to shape, giving you an immediate grasp of the child's proficiency in recognizing the distinguishing traits. The difference can be represented by color or shape.

## In Search of the Most Amazing Thing

*Spinnaker*

**System Requirements:** 32K, disk  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 9.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 9.0  
**Overall Efficiency:** 8.5  
**Documentation:** 9.0  
**Price:** \$40

Now that you're the B-Liner pilot, it goes without saying that the only challenge left is discovering the Most Amazing Thing. Of course, there's not much chance you've got the ingenuity, organization, and deductive reasoning powers to find it. After all, you'll be trekking through the Dark-some Mire, a place where everyday rules and events are displaced by the unexpected and bizarre.

If you're foolish enough to try, this program will lead you on the merry chase. Part prose adventure, part action game, **In Search of the Most Amazing Thing** is an involved exercise in note taking, logic, and analytical problem solving.

A character called Uncle Smoke Bailey accompanies the player on his quest. Uncle Smoke

once knew where the "amazing thing" was hidden, but has long since lost the way. For your amusement and edification, a novelette — "The Adventures of Smoke Bailey" — accompanies the program.

The search is randomized each time the game is played, to avoid replication of any single set of challenges. Arcade-style activities are interspersed throughout a prosaic plot. The animated graphics are curiously slick, combining simple design concepts with a contemporary flare. The illustrations are adept, abbreviated, and chic. As a video artwork, **In Search of...** ranks among the most innovative software products on the market.

This product has an almost irresistible appeal. It is destined to

become a classic in microcomputer program design — a simple yet classy fusion of early learn-

ing, visual entertainment, and analytical challenge.

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## Juggles' Rainbow

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Atari

*System Requirements:* 32K, disk or cassette  
*Program Depth & Detail:* 9.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.5  
*Overall Efficiency:* 8.5  
*Documentation:* 9.5  
*Price:* \$25

**Juggles' Rainbow** combines three stimulating, sensory programs to teach preschoolers and early gradeschoolers spatial concepts, shapes and opposites, counting, and color recognition. Children are guided through truly tasteful and colorful graphic lessons by a friendly Juggles the Clown.

Each program contains a complete instructional lesson including drill, test, and reinforcement. A concise teachers manual supplies two blue strips used to divide the keyboard into four quadrants. In "Juggles' Rainbow," when the child presses a key on the upper keyboard, arches appear above a corresponding blue line on the screen. The lower keys create dancing rain. The child plays in a milieu of music and color while exercising understanding of "up" and "down" concepts. To test the

child's mastery, the computer reverses roles and elicits responses to the positions of shapes displayed on the monitor. With two or more miscues, the child is returned to the practice tutorial. Error-free performance will culminate in a "master rendition," where the child can apply his newly developed computer skills to complete the rainbow.

"Juggles' Butterfly" and "Juggles' Windmill" continue in a similar format. As the child practices and finally creates a multi-colored butterfly, he gains recognition of "left" and "right" relationships. To construct the windmill, he must apply proficiency in all four directions.

This popular early learning program requires some initial adult supervision, and has the widest application to preschoolers from ages three to six.

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## Kindercomp

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*Spinnaker*

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 8.5  
**Support Availability:** 7.5

**Video Design & Clarity:** 9.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$30

A collection of six interactive learning games in **Kindercomp** teach letter, number, and pattern recognition. In "Scribble," the child simply presses any key to see it repeated across the screen. In "Names," a phrase is repeated in varying colors and patterns. The child can make colorful designs using either a joystick or the keyboard in "Draw". In the

other three options the child matches numbers, letters, and finds numerical sequences.

Good graphics, elementary sound effects, and colorful animation make this a fun introduction to basic reading, spelling, and counting skills for preschoolers to second grade. Adult instruction and supervision is initially required.

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## Kids on Keys

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*Spinnaker*

**System Requirements:** 16K, cartridge  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 7.5  
**Documentation:** 7.0  
**Price:** \$35

This keyboard introduction for children combines vivid graphics with motivational reinforcement in a simple, self-administered game setting. There are three separate programs, each designed to teach familiarity with different portions of the computer keyboard.

The first game is a flash card drill of simple words. The com-

puter displays a word on a floating balloon for the student to examine. The child must correctly type in the word exactly as it appears in the balloon before it vanishes from the screen.

The second game provides similar practice, using crude illustrations to depict the meanings of the words that must be typed. In the third exercise, the

child is challenged to type the number corresponding to a displayed word.

The program is recommended

for children from three to six years as a precursor to computer learning.

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## Letterman

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APX

*System Requirements:* 16K, cassette; 32K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 9.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$23 cassette and disk

A spelling program that boasts non-violence, **Letterman** follows the rules of Hangman while removing the gruesome gallows. With an apple on his head, "Letterman" waits patiently for a player to guess the secret word. The child has six tries, guessing one letter at a time. If he succeeds, a bow and arrow shoots the apple off "letterman's" head.

Colorful graphics, animation, and amusing sound enhance the player's amusement. During the game either the computer or another player chooses the word to be guessed. The software is equipped with a vocabulary of 400 words in three different proficiency levels. Following simple directions in the user's manual,

the instructor can revise the word list, replacing existing words with individually chosen lists or adding supplemental vocabularies. (Additional RAM is required for larger lists.)

The disk version of **Letterman** includes some additions. At the start of the game a player can opt for time constraint to be imposed on each guess. During play, a stumped player can ask for clues, and at the end of play, the students can glean the scores of up to nine competitors.

**Letterman** is a capable tool for reinforcing spelling skills and improving word recognition. The program is recommended for second grade readers.

## Matchboxes

*Broderbund*

**System Requirements:** 16K, disk or cassette; joystick  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 7.5  
**Documentation:** 7.0  
**Price:** \$35

The premise here is to "match" pairs of "boxes" to unveil pieces of a puzzle. If the process reminds you of the once-popular daytime television series, Concentration, you're right. This variation challenges youngsters to solve word puzzles by matching the contents of selected boxes in a grid.

The player makes his selections with the joystick, maneuvering to the box you want, then depressing the button. A match can be made by color, content, or musical rendition.

A joystick is required for play by one or two challengers.

## Mickey and the Great Outdoors

*Walt Disney Productions*

**System Requirements:** 32K disk, cassette, cartridge; joystick  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 8.5  
**Support Availability:** 7.5

**Video Design & Clarity:** 9.5  
**Overall Efficiency:** 8.5  
**Documentation:** 8.0  
**Price:** \$45

Outstanding graphics and animation, the trademark of Disney Productions, once again captures the imagination of children in an educational computer program called **Mickey and the Great Outdoors**.

Mickey Mouse takes children hiking and exploring; "Hiking" for words and "Exploring" for math facts. In both drill programs, a clever combination of timed response and imaginative storyline create an element of

suspense and excitement highly effective in sustaining a child's interest.

In "Hiking," a sentence with a missing word is displayed while possibilities float by on clouds above. The child needs to discern which word completes the sentence by first figuring out which part of speech is missing — noun, verb, adjective, or adverb. Then, using a joystick, the child must shoot down the right word before it floats away. Fortunately,

there's a friendly turtle who stops to help a child who gives two wrong answers.

Mickey directs a second word game himself, challenging the child to use the joystick to unscramble letters to form a word. Here again speed is important and a direct relation on the

score. "Exploring" drills assorted addition, subtraction, multiplication, and division problems. The player "catches" the correct answer in a butterfly net.

Superb animation in a delightful motif give this thoroughly charming learning game a classical aura.

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## Picture Blocks

*Program Design, Inc.*

*System Requirements:* 16K, cassette; 24K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$30

Designed for children from four to ten, this engaging tutorial strives to build spatial skills and shape recognition while providing an entertaining forum for individual creativity. The program consists of two modules — Freeform and Patterns.

The "Freeform" section provides a series of shapes with which the student can design his own composition. "Patterns" challenges the player to reproduce

a design displayed on the monitor.

A built-in gallery of shapes provides an ample palette for the imagination. The selections are classified under "Roads and Rivers, Wheels and Treads, Living Things, People and Places," and "Up and Away."

Minimal parental supervision and no reading skills are required to operate the software.

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## The Pond: Explorations in Problem Solving

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*Sunburst Communications Inc*

*System Requirements:* 16K, disk  
*Program Depth & Detail:* 9.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 9.5  
*Price:* \$50

**The Pond: Explorations in Problem Solving** teaches students how to use information and logic to discover patterns. Children try to make a friendly frog move through a matrix of lily pads to a specified destination without falling into the water or jumping onto the bank at the edge of the screen.

Appropriate for third graders, there are six levels of difficulty for students of varying proficiency. Each level increases the number of steps in the pattern and the

number of lily pad distractions. Each level ostensibly represents a specific pond with a distinct set of characteristics — e.g., in “Farmer Jane’s Pond” the student has twenty moves to find three patterns in any pond of his choosing. Advanced color graphics, simple animation, and random generation of problems enhance player motivation. The computer’s arrow keys control the frogs movement through the pond.

**The Pond** can be played by one or two players.

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## Pre-Reading

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*MECC*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 9.0

*Video Design & Clarity:* 9.5  
*Overall Efficiency:* 9.0  
*Documentation:* 9.5  
*Price:* \$45

**Pre-Reading** employs caterpillars, trains, and games to exercise the child’s emerging knowledge of the alphabet in letter and word recognition tasks.

Six simple programs focus on different pre-reading skills. “Caterpillars” presents a graphic

caterpillar who grows by segments as children identify missing upper case letters of the alphabet according to their sequential order. “Trains” is based on a similar premise with lower case characters; successful letter recognition completes the train

and causes it to chug away.

From four letters in the corners of the screen and a picture in the middle, children must choose the correct first letter of the image in "First Letter". "Pictures", "Words", and "Shapes" provide

variations on the Concentration rebus game. A matrix of letters with hidden pictures, words, and shapes behind them develop memory skills as children try to match identical squares.

## PreSchool Fun

*T.H.E.S.I.S.*

*System Requirements:* 16K, cassette; Atari BASIC  
*Program Depth & Detail:* 6.5  
*Value for Your Money:* 7.5  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 7.5  
*Price:* \$25

This charming cassette for kindergarten kids is a subtle fusion of color, sound, and simple keyboard practice. Two interactive learning games provide early experience in visual discrimination tasks and spatial relationships.

The first program challenges the toddler to distinguish between different colors and shapes depicted on the monitor. The

routine includes a counting drill that illustrates each digit with nursery-room graphics.

A second module creates a session of keyboard practice, demonstrating the relationships of "up" and "down," "right" and "left." In addition, the computer displays big and little letters for the child to discriminate.

This product requires the Atari BASIC cartridge.

## PreSchool IQ Builder

*Program Design*

*System Requirements:* 24K, disk; 16K, cassette; joystick  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 7.0  
*Price:* \$25

This popular series for preschoolers is designed to prepare children for "serious" elementary education topics. It focuses not on mere spatial relationships and object recognition, but rather on verbal and numeric association skills.

There are two disks in the series, each priced at \$25 (\$19 for cassette version). The programs would benefit from a more imaginative application of the computer's motivational capabilities; the graphics are unacceptably crude, but the tutorial techniques are adequate and to the point.

#### Disk 1

This early learning disk contains two tutorials — "Same and Different," and "Letter Builder." They're not mere learning games with whimsical stylism;

each is actually a response-oriented computer lesson reduced to simple joystick input.

In the first lesson, the pupil must examine two figures displayed by the computer and decide if they're the same or different. The second tutorial inverts the scenario, challenging the subject to match characters on the screen.

The computer will monitor the child's performance for parental review.

#### Disk 2

This sequel carries on in similar fashion — tasking the child to match first single characters, then complete words. Six lessons provide atomistic experience in letter recognition, numbers, shapes, and words.

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## Puzzler

APX

*System Requirements:* 32K, disk; joystick  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$25

This program is a package of twenty visual discrimination puzzles for early learners. The idea is to sharpen basic association and pattern recognition skills in an entertaining forum.

The player can preview the solution prior to starting the game. The computer displays the jigsaw pieces at the bottom of the screen and a grid at the right. Manipulating the joystick, the

child moves each piece to the appropriate space in the grid to form a part of the finished picture.

There's no "penalty" for errant insertions. But when the player has completed the picture

to his own satisfaction, the computer will point out the mistakes.

The game is scored by the number of moves utilized to finish the puzzle. The jigsaw genius is the player with the lowest score.

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## Rhymes & Riddles

*Spinnaker*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 7.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 7.5  
*Overall Efficiency:* 7.0  
*Documentation:* 7.0  
*Price:* \$40

**Rhymes & Riddles** is an early reading tool for ages five to nine. Its combined objectives include keyboard familiarity, word association, and context recognition.

Three games exercise the child's reading comprehension and composition skill. In "Jokes and Riddles", the child must type in the correct words to complete a joke or solve a riddle. "Nursery Rhymes" uses a similar technique with incomplete verses. Display of each succeeding line of the

verse is contingent on successful completion of the previous line. Solving the problem results in a graphic scenario complete with soundtrack. The third exercise, "Famous Sayings," challenges the student to complete a series of common maxims and quotations.

This is a free-form product with elementary graphics and music. The visuals are a little stark — and the rewards for positive learning behavior, sparse.

## Robin's Halloween

*Program Design, Inc.*

**System Requirements:** 24K, disk; 16K, cassette; joystick  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.5  
**Documentation:** 8.0  
**Price:** \$35

This program offers an interactive storybook for children between the ages of five and eight. The plot involves a youngster named Robin who, while trick-or-treating one misty Halloween night, happens to glance skyward to see a spaceship plummet to earth. As a narrator describes the adventures of Robin and the spaceship, the computer orchestrates a soundtrack of robot, rocket, and West Wind effects contrived from synthesized noises.

To advance the plot, the player must identify a key word by manipulating the cursor with the joystick. When the story has run its course, the computer will administer a little learning game, "Robin and the Missing Letters."

The software is supplied with a book of mazes and crossword puzzles for the solving. This is a simple and rudimentary game without elaboration, but superbly supported by synthetic speech.

## Sammy the Sea Serpent

*Program Design Inc.*

**System Requirements:** 24K, disk; 16K, cassette; joystick  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 8.5  
**Support Availability:** 7.5

**Video Design & Clarity:** 9.5  
**Overall Efficiency:** 8.5  
**Documentation:** 8.5  
**Price:** \$24 disk  
\$17 cassette

**Sammy the Sea Serpent** is a great introduction to computers for young children. Simple and fun animation, color, voice narration, music, and other dramatic sound effects carry Sammy and young children through several adventures helping the gregarious

reptile return to the sea.

Using a joystick, children move Sammy through tunnels, gardens, and forests on his arduous sojourn. The skill required to use the joystick is appropriate for three to six year olds, the recommended age group. The disk also

contains two action games — one where Sammy has to catch flies and another where children are required to guide Sammy through a maze.

Most early learners will find this imaginative program an enjoyable introduction to elementary keyboard familiarity.

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## The Stickybear ABC

Xerox Education Publications

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 7.0  
*Value for Your Money:* 9.5  
*Support Availability:* 9.5

*Video Design & Clarity:* 10  
*Overall Efficiency:* 9.0  
*Documentation:* 10  
*Price:* \$40

This imaginative alphabet program is designed for children ages three to six, but inexorably tickles parents almost as much as toddlers. Spendid animation and wryly humorous graphics create a rich montage of contemporary art and experience.

Each letter of the alphabet is represented by two different animated pictures with sound. For example, when the child depresses "B," a bumble bee appears on the monitor, buzzing around Stickybear's head. The

word "BEE" is also displayed in oversized characters. Press "B" again and the picture changes to a bouncing ball.

The software is accompanied by a hardbound book and a large wall poster. Most programs in this genre have an identical scope, but this product stands head and shoulders above the field. Its magnificent graphic qualities and charming scenarios make **Stickybear ABC** the clearcut champion among first-alphabet tutorials.

## Stickybear BOP

Xerox Education Publications

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 9.0  
*Support Availability:* 9.5

*Video Design & Clarity:* 10  
*Overall Efficiency:* 9.0  
*Documentation:* 10  
*Price:* \$40

**Stickybear BOP** is designed with the whole family in mind. Even the youngest players can stay in play long enough to feel rewarded. When Stickybear and friend appear on the screen, the object is to bop as many flying, rotating, and wiggling objects as you can before running out of balls or getting bopped by a sandbag. Each player plays six progressive rounds. The number of objects bopped determines if you can continue to the following round. In round one, Stickybear comes traipsing by doffing his hat while geese, hats, twirling moons, and sundry other objects pass over his head at different speeds. Bop one down with your pinball flipper, and you earn 200, 600, or

1000 points. Each time you flip a ball, another comes racing in from the wings to replace it. Bop ten objects and proceed to the next round. By the sixth round, you'll be bombarded with an incredible barrage of sandbags to avoid — and faced with an even larger flock of birds to be bopped from the sky.

Ingenious high-resolution graphics, remarkably adept animation, and a frantic — almost hilarious — soundtrack make this one of the classiest games ever devised for the very young — or any age.

Charming, contemporary, and very decorative, **Stickybear BOP** is a masterpiece.

## Stickybear Numbers

Xerox Education Software

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 9.0  
*Support Availability:* 9.0

*Video Design & Clarity:* 9.5  
*Overall Efficiency:* 9.0  
*Documentation:* 10  
*Price:* \$40

This elegant and charming program is designed for children ages three to six to improve their number recognition skills.

**Numbers** uses associative techniques to demonstrate what each of the basic integers means in real life. For example, press "4," and four waggling geese might wing their way across the screen. Then again, maybe four Indian chiefs in derby hats might meander over the horizon — or four puffy clouds, zoom into view from stage left. The child will eventually discover that depressing the space bar reduces the number of objects by one. Continuously depressing it makes them all disappear, leaving the stage set behind. Each time a new number is selected, a new "movie" is displayed.

The package includes a hard-back Stickybear counting book, a lavishly colored numbers poster, and punch-out stickers of our hero, all to reinforce the child's learning behavior.

Fantastic graphics, exceptional animation, and an inventive soundtrack make this product one of the truly fine early learning games produced to date. A tip of the Stickybear hat to Xerox Education Products for this masterpiece of software design.

As with all the programs in the Stickybear series, the production values are superb. Mr. Bear is congenial, debonair, and very hip. The graphics, in turn, are charming, contemporary, and subtly cynical.

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## Stickybear Shapes

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Xerox Education Software

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.5

*Value for Your Money:* 8.5

*Support Availability:* 8.5

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 8.5

*Documentation:* 8.0

*Price:* \$49

This animated program is designed to teach children three to six to identify five common geometric shapes, including the circle, square, triangle, rectangle, and diamond. Only three basic keys are used: the space bar and the two arrow keys. Both the animation and sound are superb

— and frequently, hysterical.

Each time you indicate a shape, a new illustration appears. The graphics are fun and very hip. Excellent design and an unusually diverse repertoire make this product one of the premier elementary learning games on the market.

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## Story Builder

*Program Design, Inc.*

**System Requirements:** 24K, disk;  
16K, cassette  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 7.5

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.0  
**Price:** \$20 cassette  
\$25 disk

**Story Builder** teaches grammar, spelling, and vocabulary skills in a learning game format. Colorful graphics and sound provide motivational reinforcement to an otherwise standard tutorial set. Designed for students nine and older, the program provides three interactive games, each focusing on a specific skill.

The first program reviews the definition and function of nouns, adjectives, and verbs. The student is challenged to apply this information to the identification of speech parts in randomly selected sentences displayed on the

monitor screen.

‘Fractured Nursery Rhymes,’ the student is asked to supply word types which are subsequently used in a familiar nursery rhyme. An incorrect word will “fracture” the rhyme into an occasionally hilarious but more frequently bizarre demonstration of the importance of grammatical construction.

The third program in the series is a letter guessing game that involves knowledge of spelling rules and practice in logic and deductive reasoning.

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## Teacher's Pet

*T.H.E.S.I.S.*

**System Requirements:** 16K, cassette;  
24K, disk  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 7.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.5  
**Documentation:** 7.0  
**Price:** \$15 cassette  
\$19 disk

**Teacher's Pet** contains three interactive games for early learners, including a counting program, a session of elementary arithmetic, and an alphabet tutorial.

“Counting Practice” introduces children to the digits by challenging them to count the number of shapes displayed on the screen.

A second game called "Arithmetic Skills" demonstrates the concepts of addition and subtraction. The "Letter Recognition" drill tests the child's alphabet proficiency.

Early learning games necessarily rely heavily on vivid graphic techniques to illustrate concepts that would otherwise require reading competency. **Teacher's Pet** strives admirably to personify this premise, but falls considerably short of the mark. The graphic content is clearly intended to ap-

peal to small children but appears crude and amateurish by contemporary standards. Since even toddlers are exposed to a broad spectrum of sensory stimuli in today's "electronic village," few children will overlook this flaw.

However, the program's focus and structure are well conceived and competently executed. Despite its design weaknesses, **Teacher's Pet** is a good first computer program to help youngsters become comfortable at the keyboard.

## Teddy's Magic Balloon

*Program Design, Inc.*

System Requirements:	24K, disk; 16K, cassette; joystick
Program Depth & Detail:	7.5
Value for Your Money:	7.5
Support Availability:	8.0

Video Design & Clarity:	8.0
Overall Efficiency:	8.0
Documentation:	7.0
Price:	\$35

At first glance, you'd think Teddy was an ordinary little boy. That is, if you didn't know he had in his possession a perfectly magical balloon. He uses it to sail to places you've never imagined existed — all of them sites for remarkable adventure.

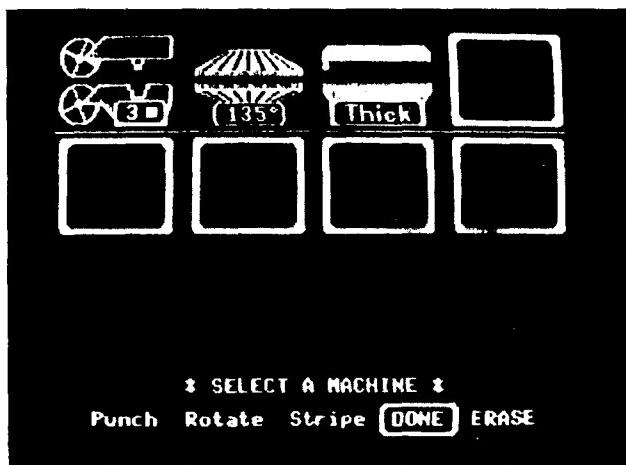
**Teddy's Magic Balloon** is an interactive, voice-dependent storybook for children from three to six. The Atari speech chip synthesizes a narrator who describes the action as the computer exer-

cises the student's developing learning skills.

On Teddy's adventures, the child controls the direction of the magic balloon with the joystick, rescuing him when he soars into peril. At the story's end, a brief learning game exercises the pupil's word recognition skills.

The software is supplied on disk or cassette, accompanied by a printed storybook, "Teddy's Best Friend."

## Verbal Skills and Social Studies



The Factory — Sunburst Communications



Magic Spells — Opportunities For Learning, Inc.

## Advanced Fingerspelling

APX

System Requirements: 32K, cassette or disk  
Program Depth & Detail: 9.0  
Value for Your Money: 9.0  
Support Availability: 9.0

Video Design & Clarity: 9.0  
Overall Efficiency: 8.5  
Documentation: 8.5  
Price: \$25

A modified version of **Finger-spelling, Advanced Fingerspelling** uses tasteful and clear graphics to demonstrate and teach the skill of fingerspelling. Useful in communicating with the deaf and in environments where speech is ineffective, this program takes the user from beginner to advanced proficiency level at an individual pace that is suitable for children and adults.

Teaching by demonstration,

drill, and test, the tutorial starts with letters of the alphabet. When the student feels comfortable with a sound knowledge of letters and basic technique, the program advances to word and sentence construction and comprehension. The computer monitors student efforts on bar graphs. The disk version allows the user to add words or sentences to the existing data file.

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## Astrology

APX

System Requirements: 40K, disk  
Program Depth & Detail: 8.0  
Value for Your Money: 8.0  
Support Availability: 8.5

Video Design & Clarity: 8.5  
Overall Efficiency: 8.0  
Documentation: 8.0  
Price: \$25

**Astrology** explains and charts the signs of the zodiac, planetary positioning, natal charts, and rising signs.

When you boot the program, the computer prompts you for the exact place, time and date of your birth. You then have to enter the location in geographical coordinates. Not all of us have

this particular information at our fingertips, so the program will compute it as you move the cursor around a map of the United States and the world.

Once you have entered the required information, **Astrology** gets busy stargazing; when your data is successfully processed, the computer will display a chart

representing the earth, zodiac, and location of the twelve astrological houses at your time of birth. This program also illustrates the relationships of the planets to the houses.

In case you can't remember all the signs, they're displayed for you on the right side of the screen. To interpret your chart, you consult the user's manual.

This program will be appreciated by astrology enthusiasts, although you'd better have a

rather large entourage of friends, relatives, and associates to "process." We showed this program to a professional palmreader who raised an eyebrow over the impressive graphics but smirked cynically at the readings. Naturally, no two experts are likely to agree about this sort of thing. As a software tool, the program has a fluid design, captivates the attention, and seems to perform according to its promises.

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## Atari Sentences

Atari

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

Youngsters will delight in seeing their sentences come to life in **Atari Sentences** as "A cow jumps over the moon" makes a colorful graphic cow take the traditional jump. Learning simple sentence structure is fun with colorful graphic figures and visual animated rewards of one's own creation. Anything's possible, and children will giggle to see houses

fly and trees jump.

The format is simple. The main screen shows a list of nouns, verbs, articles, and prepositions. The child uses the joystick to position the words into sentences. The possibilities are endless — and the motif, captivating. Use **Atari Sentences** with kindergarten through second graders.

## Compu-Read 3.0

Edu-Ware

**System Requirements:** 48K, disk; 32K, cassette  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 9.0  
**Support Availability:** 7.5

**Video Design & Clarity:** 8.5  
**Overall Efficiency:** 8.5  
**Documentation:** 8.0  
**Price:** \$30

A reading instructional tool, **Compu-Read 3.0**, focuses on speed and recall. Four modules teach letter recognition, word recognition, vocabulary, and comprehension. The program features an extensive user management system allowing study to be geared to individual pace and ability plus continual evaluation of student progress. Comprehensive documentation covering the educational theory employed in the learning exercises is provided in a twenty-four page package.

The order in which material is presented in the four modules can be altered by the user, however the program logically begins with "Letter Recognition" an exercise that requires the reader to recall three letters which flash on the screen for a moment. "Rapid Words" works on recognition of the shapes and patterns that the letters make in the whole word in a similar speed drill fashion. Vocabulary skills increase as readers are quizzed on the meanings of "Synonyms and Antonyms". Students are drilled on comprehension in "Sentences" a learning game where they are asked questions pertaining to the

meaning of a sentence that has flashed on the screen for an instant.

The "instants" these letters, words, and sentences flash on the screen is the focus of the user management system. Fourteen pages of documentation clearly instruct teachers in how to personally adjust the order or number of modules in a session, the initial speed, the speed increment (the speed increases automatically by increments as students show improvement and success), the amount of time between trials, and the type font size.

The display format is serious and organized with clear presentation and choices. A child who has never used the program will require initial operating instructions from a qualified teacher. Answers are typed on the keyboard with one frustrating difficulty being the lack of a capacity to change or erase a letter once it is typed.

The material covered is fairly extensive and varied and could be used appropriately in conjunction with a classroom reading program for students eight years old and older.

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## Concentration

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Atari

<i>System Requirements:</i>	24K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.0	<i>Overall Efficiency:</i>	6.5
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.5	<i>Price:</i>	\$30

This learning game is yet another based on the popular TV game show in which contestants vie for toaster ovens and year-long supplies of floor wax by matching the contents of two boxes from a grid. Aside from that, this product is more like "Jeopardy," the game that awarded prizes for trivial knowledge in a wide range of topics.

In Atari's **Concentration**, the

categories are equally diverse, with questions covering American presidents to chemistry. Junior high school students try to match as many of fifteen windows as they can in the least amount of time.

This game can be customized to individual curricula. You can create your own matched pairs for the computer to randomize, extending the program's utility to virtually any subject area.

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## Counting

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MECC

<i>System Requirements:</i>	48K	<i>Video Design &amp; Clarity:</i>	9.5
<i>Program Depth &amp; Detail:</i>	9.5	<i>Overall Efficiency:</i>	9.5
<i>Value for Your Money:</i>	10	<i>Documentation:</i>	9.5
<i>Support Availability:</i>	9.5	<i>Price:</i>	\$44

Counting balloons, pieces of blueberry pie, banjos, televisions, and footballs removes the drudgery from beginning arithmetic drill. Imaginative and attractive graphics and animation highlight **Counting** which is organized into six separate skill lessons for kindergarten to second grade.

In two separate ranges from 1-10 and 1-20, the lessons cover counting practice, counting specific objects from a mixed group, and addition facts on pictorial level. The format is simple and unthreatening. In "Smile" the numbers 1 to 9 appear in yellow at the bottom of the screen and some number of ob-

jects at the top. The only words the child has to read is a friendly "How many?" with the object in question after the words and a big question mark. The child counts and chooses a number. If s/he is correct a smiling face and the flashing correct number will appear. If wrong the wrong answer disappears from the numbers on the screen and s/he tries again until the correct response is given.

Kids at this age thrive on fan-

tasy and delight in the imaginary "Wuzzle" who rewards them for counting the correct number of mixed objects by doing a little trick. "Spaceship", "Smile More", "Return of the Wuzzle", and "Saucer Shoot" all make basic arithmetic drill fun.

**Counting** comes with a 32-page support manual and is appropriate as a home teaching aid or in the classroom with one or small groups of students working on their own.

## Diascriptive I

### Educational Activities

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$295

This program derives its name from a combination of learning diagnosis and prescriptive teaching technique. In the first place, the program diagnoses the student's reading skills. In the second, it prescribes a specific plan of improvement. Next it administers an atomistic sequence of developmental lessons and response questions, and finally, the program evaluates the student's individual performance at each level before permitting progression to the next.

**Diascriptive I** consists of six diskettes containing a diagnostic

test for all skill levels, and five interactive content programs:

- Vocabulary
- Sequence
- Details
- Inference
- Main Idea.

The specific difficulty levels are determined on the basis of SAT standards, from 1.5 to 5.5.

The lessons are characterized by brief demonstrations of the subject matter, e.g., a chart, paragraph, or outline. After studying the display, the student applies associative skills in responding to specific interpretive questions. The

computer reinforces positive progress with an animated reward, and corrects errant input to demonstrate the proper response. The lessons have a game motif to enlist motivation.

An integral management system

records the student's progress for analysis by an instructor upon completion. This product is highly individualized, with adequate attention to self-pacing and a well structured approach to behavior modification.

## Diascriptive II

*Educational Activities*

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.0

*Value for Your Money:* 8.5

*Support Availability:* 8.0

*Video Design & Clarity:* 8.0

*Overall Efficiency:* 8.0

*Documentation:* 8.5

*Price:* \$365

The second in a series of reading skills tutorials based on diagnosis and prescription,

**Diascriptive II** covers a similar scope as its precursor:

- Vocabulary
- Fact/Opinion
- Sequence

- Details
- Main Idea
- Inference.

The SAT difficulty levels are rated at 3 to 8. For a discussion of the Diascriptive approach and teaching technique, please refer to the preceding evaluation.

## Excalibur

*Atari*

*System Requirements:* 48K, disk; joystick

*Program Depth & Detail:* 9.0

*Value for Your Money:* 10

*Support Availability:* 9.0

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 9.0

*Documentation:* 9.0

*Price:* \$30

Based on the story of King Arthur and his legendary consolidation of the split feudal

kingdoms of Camelot, **Excalibur** simulates the many facets of government. Both a lesson in

medieval history and contemporary government, **Excalibur** promotes learning in a thought provoking and engrossing game structure.

The plot unfolds as Arthur takes his rightful throne as king in Camelot and starts his rule. Using his Magic sword Excalibur, the wizardry of his friend Merlin, and his own careful judgement, Arthur must make decisions involving economics, diplomacy, magic, military strategy, and the loyalty of friends and relatives. The student becomes "Arthur", using a joystick to move from the Round Table room, in a sequence

of events and political strategy, to the throne room, the Treasury, and Merlin's lair.

You have the option of leaving the castle and striking out across a map of Britain to battle with enemies and gain further control over the warring kingdoms.

Recommended for age 13 and older, **Excalibur** provides exercise in analytical problem solving and deductive reasoning with no "right" or "wrong." As in real life, each decision alters the direction of future events.

The software is supplied with a brief manual and a full-length novel written for **Excalibur**.

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## The Dragon Games

### Educational Activities

*System Requirements:* 48K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$60

This package contains six interactive learning games, each of which focuses on a specific part of speech. All the games are electronic exercise drills disguised as simple board games: the student advances his marker along a boardwalk by supplying the correct answers to elementary grammar problems.

The game set includes:

- The Dragon of Nouns
- The Dragon of Verbs
- The Dragon of Adjectives
- The Dragon of Synonyms
- The Dragon of Antonyms
- The Dragon of Contractions.

Each game is prefaced by an abbreviated overview of the part of speech in question. Correct

responses advance the player in the direction of a "Safety" goal, but wrong answers set him on the path to "Doom." The computer will branch to re-explain basic concepts when the student strays from accuracy.

As is typical of this genre, the pace is rather languid in relation to the amount of exercising actually delivered. Still, the board-game motif is a good device for enlisting the attention of third to fifth graders.

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## The Factory: Strategies for Problem Solving

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*Sunburst Communications*

*System Requirements:* 16K, BASIC; cartridge  
*Program Depth & Detail:* 9.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 9.0  
*Documentation:* 9.0  
*Price:* \$35

**The Factory** challenges the creativity of upper grade school students and older. Working with a simulation of a real factory, students learn to use "machines" that punch one, two, or three holes in a square; rotate the square 45, 90, 135, and 180 degrees; and apply a thin, medium, or thick horizontal stripe. In this fashion, students practice designing different products in a free-form game called "Make a Product".

There are two other options. In "Build a Factory," students build an assembly line with the machines and produce a "prod-

uct" of their own design. "Make a Factory" tests the learning processes of the first two options by presenting students with a product and requiring them to demonstrate how it was made. This is an excellent exercise in process analysis and inductive reasoning since it necessitates working backwards to solve the problem.

This unique program features advanced color graphics, animation, and random generation of problems. The software is supplied with a helpful teacher's guide, documentation, and a back-up disk.

## Fingerspelling

APX

*System Requirements:* 16K, cassette; 24K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 9.0  
*Documentation:* 8.5  
*Price:* \$25

A simple to use and understand tutorial, **Fingerspelling** teaches the basics of fingerspelling to people of all ages.

The program is clearly divided into tutorial and drill, "Show Me" and "Test Me". In "Show Me" the screen displays the upper body of a person and his hand demonstrating the finger position of one letter of the alphabet. Lessons move the student through all the letters of the alphabet to simple words and phrases. In "Test Me" a letter or word is

shown in fingerspelling on the screen and the student has to type the correct meaning. The length of time allowed for a response is chosen from nine graduated possibilities, "turtle" to "cheetah". The computer scores each player on his performance.

It's worth mentioning that fingerspelling is not a skill limited to the deaf. The technique is equally as valuable in communicating with the deaf or in situations where hearing is difficult or impossible.

## Fishing for Homonyms

T.H.E.S.I.S.

*System Requirements:* 16K, cassette; 24K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$20 cassette  
\$25 disk

A multimedia approach in motivational courseware, **Fishing for Homonyms** combines lists of homonyms, the game of Fish, large colorful easy-to-read graphics, synthetic sound, and the capability of speech.

**Fishing for Homonyms** drills

students in more than 150 sets of homonyms in a game format similar to the traditional card game "Go Fish". The student plays against the computer. When asking the computer for a "word," the student is required to spell both forms of the

homonym. Players can study a sample word list before undertaking the challenge.

With a Vortrax Type N' Talk module, students can hear the similarities between the words

while looking at the spelling differences.

Suitable as an introduction, drill, or reinforcement lesson in homonyms, **Fishing for Homonyms** improves spelling and vocabulary in grades 3-6.

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## Franglais

*Program Design, Inc.*

*System Requirements:* 16K, cassette; 32K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$50

**Franglais** is designed to teach the user to speak French like a native. Of course, without an experienced human to correct your pronunciation and accent, it's more likely you'll end up speaking French with excellent grammar but an American accent. If your goal is learning to read and translate French and English interchangeably, this program may suit your needs.

The program offers three user-selectable levels, based on a dictionary of 1,000 words and 100 spoken sentences. An interminable exercise drill prompts you to translate French to English

and English to French.

The computer will display a randomly retrieved word in one language, and the student must correctly type in its translation. A correct answer is rewarded with a computer can-can — a reinforcement unlikely to be appreciated by many female French students.

An accompanying audio tape offers practice in pronunciation and recognition. The package also includes a French-to-English dictionary (a \$2.95 value in most book stores).

Sure, a good Berlitz course might be cheaper, but hey: the computer tutor has nice legs.

## Geography

MECC

System Requirements:	48K, disk	Video Design & Clarity:	8.5
Program Depth & Detail:	8.5	Overall Efficiency:	8.5
Value for Your Money:	8.5	Documentation:	9.0
Support Availability:	8.0	Price:	\$45

A standard drill and self-paced study, **Geography** offers four programs which help students review and memorize geographical facts.

“States” provides practice in identifying the shape and geographical region of each state and allows two chances to answer correctly. “Capitals” can be used as a quiz for the state or the capital or a combination of the two. In “Continents” a country is randomly generated from a list of eighty-six and the student must

identify on which continent it is found. The most challenging option is “Countries” which requires students to respond with the capital city for any country on the list, some of which are very obscure.

Students in fourth to tenth grades could find **Geography** an effective way to learn about the countries and cities of the world. The program provides teachers with a forty-two page support manual.

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## How to Read in the Content Areas - Science, Social Studies, Literature, Mathematics

Educational Activities Inc.

System Requirements:	48K, disk	Video Design & Clarity:	8.5
Program Depth & Detail:	9.0	Overall Efficiency:	8.5
Value for Your Money:	9.0	Documentation:	9.0
Support Availability:	8.0	Price:	\$190

A four disk series, these programs focus on the unique skills and concepts necessary for effective reading in content areas. Each content area is a separate disk following a format that op-

timizes the learning process through use of individual interaction and response, attractive graphics for motivation and reward, and immediate evaluation and appropriate reinforcement.

Grades 5 and 6 or remedial grades 6 and 7 will benefit from **How to Read in the Content Areas - Science, Social Studies, Literature, and Mathematics.**

Students work at their own pace through tutorials covering vocabulary, main ideas, and details related to the content area.

If student responses indicate confusion, the computer immediately reviews and reinforces the material. Clever graphics and subtle animation continually reward students' efforts, and the computer rates performance at the conclusion of each session.

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## Independent Reading Level Test

*Educational Activities Inc.*

**System Requirements:** 32K, disk or cassette  
**Program Depth & Detail:** 7.0  
**Value for Your Money:** 7.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 7.5  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$30 disk  
\$25 cassette

Based on the "O'Brien Vocabulary Placement Test" developed by Janet O'Brien, M.A., this program tests the student's vocabulary proficiency to place him in a specific reading level.

Presumably free of cultural

biases, the program measures reading skills from grades one through seven.

Note that this is a placement test, not a vocabulary exercise drill. The software is supplied on diskette (\$30) or digital tape (\$25).

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## Magic Spells

*Opportunities For Learning*

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 7.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 7.5  
**Overall Efficiency:** 7.0  
**Documentation:** 7.0  
**Price:** \$45

Trekking through Spells Valley you come upon the Kingdom of Spells, where 20 chests of gold and jewels lie hidden in a desolate castle. Find them, and they're yours — providing you know the right "spells." But behind you in the shadows, stealthy, invisible, sinister, lurks the Demon of Spells.

Actually, there's nothing magic about these spells at all. Each is a scrambled word which the player must first unravel, then correctly spell. A correct answer on the

first try opens one of the 20 chests. Give a bad answer, and the computer will offer a hint — but the demon will divide up the lucre.

**Magic Spells** is a word scrambling game with a distinct, "dungeons and dragons" flare. As an aside, the program teaches a little spelling. The software is supplied with a dozen lists of scrambled spellings.

This product lacks context — an important ingredient in spelling proficiency.

## MasterType

Scarborough Systems

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 9.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$50

Most typing tutors have a straight-laced, no-nonsense "method" to master and an ample bag of pithy "theories" to contemplate. Here's a mildly amusing, fast-paced typing drill with as much nonsense as you like.

In **MasterType**, it's you against the Words. Posed as the master of your free flying Type ship, you're about to be attacked by a furious onslaught of laser fire from all directions. Your only defense is your paltry typing skill.

The alien Words appear on all

sides of your ship — taunting you with a single letter, a simple word, or a challenging phrase. You've got to read them quickly, because the Word ships have launched a fusilade of photon torpedoes to blast you from the heavens. Type all four words without an error, and you'll disintegrate the invading ships. Fumble around at the keyboard or hesitate before you type, and it's "Good Bye, Galaxy."

Needless to say, the more Words you shoot down, the more furious their onslaught. The only

way to survive is to become a fast, proficient typist in complete mastery of the entire keyboard. After all, isn't that why you bought this program in the first place?

As you can visualize for yourself, **MasterType** is as much a "game" as a learning tool. We recommend it for younger stu-

dents of the keyboard arts in need of a rudimentary conditioning tool for touch typing. Adults, of course, will take more kindly to tutorials that include the overblown "theories" and ballyhooed "methods" from whence bespectacled secretaries with button-down shoes are born.

## Memory Builder: Concentration

*Program Design, Inc.*

**System Requirements:** 16K, cassette;  
24K, disk

**Program Depth & Detail:** 7.5

**Value for Your Money:** 7.5

**Support Availability:** 8.0

**Video Design & Clarity:** 8.0

**Overall Efficiency:** 8.5

**Documentation:** 7.0

**Price:** \$17 cassette

\$24 disk

Perhaps the most "educational" aspect to **Memory Builder** is the fact that it's produced by Program Design, Inc. — a company with a decent track record and an ample catalog of learning games for elementary age computerists. In most other respects, this product is more "game" than "memory builder," with a loose structure modeled after the popular Concentration TV quiz show from the 1960s. You probably recall the motif: guest contestants vacationing in Hollywood from Nebraska tear their hair out to remember the names of prizes hidden on the back panels of

revolving cubes.

**Memory Builder** uses the identical scenario but without the electric blenders, coordinated bath towels, and prepaid airfare to Waikiki Beach. In this crude hybrid, your youngest family members select pairs of rectangles on the computer screen, unveiling behind each a simple word of second grade vocabulary level. For picking matching words, the student is awarded a score.

A single player can take on the computer, or two can compete with your Atari as the Master of Ceremonies.

## Montana Reading Program

*Program Design, Inc.*

<i>System Requirements:</i>	16K, cassette; 32K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	9.0	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$35 cassette \$37 disk

The **Montana Reading Program** was developed to aid early readers in mastering the words that make up the Dolch list, a presumably "standard" vocabulary prerequisite to reading competency. According to the producers, the program has been validated in use as an effective alternative to traditional sight reading methods. The disk con-

tains five tailored word lists ranging in sophistication from preprimary to third grade. In each level, the computer displays a complete sentence with a missing word which the student must supply. Clues are given in the form of letter shapes and "ghost front" characters. The computer awards points for correct entries.

## My Spelling Easel

*Atari Inc.*

<i>System Requirements:</i>	16K, cassette; 24K, disk	<i>Video Design &amp; Clarity:</i>	9.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	9.0
<i>Value for Your Money:</i>	9.0	<i>Documentation:</i>	9.0
<i>Support Availability:</i>	9.0	<i>Price:</i>	\$30 cassette and disk

Composite visual and animation effects punctuate this interactive word recognition drill. The idea is to create simple designs as a mechanism for gaining basic keyboard familiarity and elementary training in letter and word recognition.

Four skill level options begin at a level appropriate for pre-

schoolers with little or no letter recognition skills. When the computer displays a word at the bottom of the screen, depressing any key will produce an associated graphic.

The next level of difficulty requires the child to press a key corresponding to any letter that occurs in the given word. In the

third, the player must successfully press all the letters in no particular order.

The fourth level calls for the child to be able to copy the word exactly as it appears on the screen. Successful reconstruction of several words will create an entire

landscape; using either keyboard commands or a joystick, the player can alter the coloration.

The requisite skill level seems suitable for pre-school to second grade. The software is accompanied by a lucid user's guide with simple, step-by-step instructions.

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## Prefixes

MECC

*System Requirements:* 48K, disk

*Program Depth & Detail:* 9.0

*Value for Your Money:* 9.0

*Support Availability:* 8.0

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 9.0

*Documentation:* 9.5

*Price:* \$45

The computer optimizes student involvement and motivation with the effective use of user-interactive programming and visual graphic reward in **Prefixes**, a series of learning games designed to teach third to sixth grade vocabulary skills.

The tutorial seeks to promote a solid understanding of five prefixes; "un", "re", "dis", "pre", and "in", by approaching the subject from different perspectives. Initially, a colorful dragon introduces the meaning of each of these prefixes and then tests the children by giving the meaning and asking for the correct prefix. Next, the important distinction between root word

and prefix is explored through imaginative sentences and a graphically illustrated story. To reinforce these lessons, the children participate in the unfolding of two stories, one about a sad dragon and the other about a friendly robot; completing sentences using words beginning with the different prefixes studied.

Children who have the opportunity to experience this program are highly likely to remember the function of a prefix and the meaning of "un", "re", "dis", "pre", and "in", thereby significantly increasing their vocabulary skills.

## Preparing for the SAT

*Program Design, Inc.*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	7.5
<i>Support Availability:</i>	7.5	<i>Price:</i>	\$125

This thorough SAT preparatory aid can definitely make a difference in a student's final score. Many students are never adequately trained in test taking techniques, analogies, or the type of analytical arithmetic involved in this nearly universal college entrance examination.

This product is unquestionably the most versatile of the SAT indoctrination programs, with separate modules covering:

- Preparing for aptitude testing
- SAT vocabulary list and definitions
- Analogy problems
- Number series
- Quantitative comparisons.

The package includes six diskettes and an audio tape accompaniment.

Three programs are especially valuable. The vocabulary section is based on synonyms and antonyms used in actual SAT tests. The probability is high that a great number of the words tested

in any given year can be found in this module. The analogies program illustrates strategies for solving typical problems written in the same style as those on the exam. The problem with analogy problems is that there's no "correct" answer in a literal sense; it's largely a question of interpretation in light of previous cultural conditioning. Again, this program supplies an "SAT perspective" on understanding analogies.

The number series program demonstrates the most commonly used formulas underlying typical SAT problems in this category. By learning the strategies, the student can test various number series for suitability, rather than trying to intuitively solve the patterns.

This is a highly recommended program for students with serious collegiate objectives, especially those who need high SAT scores for placement in a competitive school.

## Presidents of the United States

APX

**System Requirements:** 24K, cassette; 32K, disk  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 7.5  
**Price:** \$18

Who wrote the Declaration of Independence? What president founded the League of Nations? Which one was in attendance at the Battle of New Orleans? If you don't know, you're in trouble with this computer-administered flash card series.

This program has two skill levels. In the "Novice" mode, the player selects his answer from a multiple choice display. In the more challenging "Expert" mode, you're on your own to

recall the name of the right president and correctly type in at the keyboard. The computer will offer hints in either level, but you'll have only one opportunity to peek at the clue. Each player receives a score based on the number of correct responses from a total of forty questions.

The game lacks any specific tutorial objectives or instructional focus but provides a broad-brush exercise in "Presidential trivia" for any age group.

## Readability Index

Educational Activities

**System Requirements:** 32K, disk or cassette  
**Program Depth & Detail:** 6.0  
**Value for Your Money:** 7.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 7.0  
**Overall Efficiency:** 7.0  
**Documentation:** 7.5  
**Price:** \$25 disk  
\$25 cassette

According to the "Bormuth Formula," any standard English paragraph can be measured for its compatibility with a specified grade level by analyzing certain arbitrary characteristics of the prose. The parameters include average length of words, average length of sentences, and a quan-

titative index for difficulty of comprehension.

This program actually applies the Bormuth Formula to any entered text. The idea is to provide a practical measure for determining the suitability of reading materials for particular classes and grade levels.

The operator simply keys in three paragraphs from the subject text. **Index** calculates the "Readability" and specifies the appropriate level.

Unquestionably, quantitative evaluation techniques provide a sound mechanism for selecting classroom materials; however, any such approach is only as valid as it can be applied in con-

junction with subjective measures — foremost among which is the instructor's own grasp of the subject matter, classroom experience, and intimate recognition of his students' relative preparedness for the material.

The diskette version is priced at \$25; the same program on cassette is available for \$20.

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## Reading Comprehension: What's Different?

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PDI

*System Requirements: 16K, disk and cassette  
Program Depth & Detail: 8.0  
Value for Your Money: 9.0  
Support Availability: 7.5*

*Video Design & Clarity: 8.0  
Overall Efficiency: 8.0  
Documentation: 8.0  
Price: \$20 cassette  
\$25 disk*

A series of learning games for graduated reading levels, **Reading Comprehension: What's Different** is designed to increase the reading comprehension of elementary school students. Ten game levels contain word lists for grades two to six, offering continual challenge and skill development.

The game format is the same for all grade levels. Students are presented with four words. Three of the words have some associated meaning while one of them is different. Students read the four words and type in an

answer. If correct the computer rewards the student with a written explanation of why the word is different by telling what the others have in common.

All rewards and response in this program are presented in text, as opposed to graphically displayed, as deemed appropriate by the developers for a program teaching reading comprehension. **Reading Comprehension: What's Different?** is suitable as a teaching aid in a reading curriculum.

## Spellagraph

*DesignWare*

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 9.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.0  
**Price:** \$39

Six doors hide a message. Opening in sequence, they reveal four pictures: a wishing well, a pocket comb, the number two, and a decorative spelling of the name of this game. Read them together and you've got:  
“WELL...COMB...2...  
SPELLAGRAPH”. Any one of 200 built-in rebuses may follow.

As you might have guessed, **Spellagraph** is as much a game as it is a learning tool. The program uses the rebus puzzle made famous by the TV quiz show “Concentration”, revealing one piece of the puzzle each time the student enters a correct response. In this case, a correctly spelled word must be entered in context to complete a sentence. The student has first to determine the right word, then spell it correctly. For a right answer, the student earns a point and gets to see another piece of the puzzle. Spell it wrong, and the computer makes you type it over until it's right.

Each game is based on a dif-

ferent phonetic rule. Selecting from a menu, the student takes on vowel sounds, combinations, consonants and clusters. The instructor can create his own exercises for any of the integral rebus puzzles.

The game can be varied for difficulty and complexity. The more sophisticated the context sentences and target words, the more doors that have to be opened to see the puzzle.

**Spellagraph** is essentially a merger of flash card and puzzle game computerized for random generation and self-administration. It's not quite programmed learning, but its interactivity and reinforcement of learning behavior are instructionally sound principles.

The program has excellent graphic quality deserving of a dedicated monitor with decent resolution. The software requires a color graphics adaptor. This flexible, context spelling tool is affordably priced at \$39.

## Spellbound

T.H.E.S.I.S.

*System Requirements:* 24K, cassette  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 9.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$20

This versatile spelling program includes a comprehensive data base of commonly misspelled words that can be supplemented by the instructor.

Words are displayed in vivid, oversized graphic characters with sound and some animation. Choose one of two program formats, learning or testing. In the learning mode, the computer displays a word on the monitor screen for the student's inspection. When he's ready to proceed, the student presses the key corresponding to the first letter of the word, then completes the spelling. A correct entry will be

rewarded with a computer accolade. A word incorrectly spelled will be re-inserted in the queue for future display.

The learning section is completely self-paced, with no timed drill sequences or competitive pressures. In contrast, the test mode flashes each word on the screen quickly for a correct spelling.

The program accommodates students in grades one through twelve and can be customized to virtually any learning curriculum. The focus is on rote behavior, without elaboration on phonetic, root, or structural concepts.

## Spelling Bee

MECC

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 9.0  
*Price:* \$44

**Spelling Bee** is an electronic flash card set that attempts to cover all the bases. It contains an integral data base of over 400 commonly misspelled words, ac-

companied by context sentences, student drill and timing options, and score evaluations at the end of each drill. A lucid instructor's guide shows how to change the

data base, modify and construct sample sentences, and adjust the timing for individual classroom requirements.

This computerized spelling bee is supplied with its own animated bee. The student or instructor can specify a drill number of from one to twenty words, selecting untimed, slow, double, or racing speed. Each word problem con-

sists of a context sentence (with the word missing) and three choices of the correct spelling.

In the timed drill sequences, the animated bee flies across the screen when the time is up. The computer will correct errant responses, rate the student's performance, and prescribe a list of practice words for further study and review.

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## Spelling Builder

PDI

*System Requirements:* 16K, cassette;  
24K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$20 cassette  
\$25 disk

A series of eight lessons in **Spelling Builder** teach spelling rules at an intermediate or advanced level. Designed for junior high school students to adult, students who have already mastered basic spelling will be pleased to find a program geared to more advanced needs, such as, deciding which is the correct spelling between "supersede" or "supercede" or is it "combustible" or "combustable"?

The eight lessons cover the following rules: Syllabification, Rules for Syllabification, Doubling Final Consonant, Final "E" with Suffixes, Adding Suffixes to Words Ending in "Y", Tricky Plurals, "IE" or "EI",

Troublesome Suffixes, and a three-hundred-and-twenty-word Spelling Test encompassing all the rules learned.

The format for each lesson is similar. First the rule is displayed on the screen, demonstrated with examples, and then the student is drilled on the rule by being asked to spell words containing the letters involved in the rule. If the student makes a mistake the computer will give hints.

**Spelling Builder** offers a voice track which adds an audio dimension to the learning process. An audio cassette player is required for the disk version of this program.

## Spelling Genie

Atari Inc.

*System Requirements:* 24K, disk; 16K, cassette  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 9.0  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$23 cassette and disk

Comprehensive and versatile, **Spelling Genie** teaches spelling and vocabulary skills to a wide age group (recommended for ages 5-14). Colorful graphics and animation illustrate four different learning games children have enjoyed on paper for years. Teachers have the option of creating and editing their own word lists so that the games become an integral part of the classroom curriculum.

The games can be played by one child competing against a clock or by two players competing for the winning score. "Pop On" drills words and visual memory by requiring a player to spell a word that flashes on the screen for an instant. "Mix Up" is the typical scrambled letters game and promotes interest in

typical letter groupings (e.g. digraphs, consonant blends). In "Vowels" students complete words in which all vowels are blanks.

Students are rewarded by a "whizzer" that shoots across the screen when they correctly spell one word "spun" from a ten-word list in "Word Whizzer." If a student has trouble with a word, the computer can supply a hint or demonstration.

A tournament option motivates students to play all four games consecutively. With a printer, students can print lists of problem words prescribed by the computer. **Spelling Genie** is supplied with nine built-in spelling lists and an instructor facility for customizing the master dictionary.

## Spelling In Context

Atari Inc.

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 9.5  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 9.0  
*Documentation:* 9.0  
*Price:* Quoted by Vendor

An expansive and comprehensive spelling program, **Spelling in Context** provides a thorough spelling tutorial for reading levels one through eight. Voluminous amounts of material, including more than 320 question lessons covering over five thousand words fill a ten-disk series. Spelling words are presented in context — an educational philosophy that greatly increases vocabulary skills while providing associative structure for memorization.

An autotutorial format teaches, drills, tests, and evaluates — emphasizing student interaction and immediate response. Branching according to ability, each level offers self-contained lessons that address a particular phonic, spelling, or subject matter. For example, lesson 3 in Level 1 teaches recognition of short “e’s”, while lesson 36 in Level 8 covers important business terms. Each Context Level is recommended for its corresponding number grade level. A synopsis of Context Levels 1 - 8 is as follows:

Context Level 1 introduces elementary vowel sounds, double consonants, number words, color names, scholastic words, and more.

Context Level 2 builds on the preceding level and adds exercises in “ing” and “th” words, homonyms, unusual spellings and time words.

Context Level 3 introduces many double vowel combinations, unusual consonant combinations, weather and calendar words.

Context Level 4 introduces hard and soft “c’s” and “g’s”, plural endings, root words, compound words, contractions, apostrophes and language arts terms.

Context Level 5 teaches silent consonants, “r”, “schwa”, abbreviations, mathematical terms, and more language arts.

Context Level 6 reviews many of the difficult sections of the previous levels and covers prefixes, suffixes, unusual plural endings, advanced mathematics and language arts terms.

Context Level 7 concentrates on difficult or unusual spellings, tricky prefixes and suffixes, words with Latin and Greek origins, confusing homonyms and business terms.

Context Level 8 reviews silent consonants, introduces hyphens, antonyms, French root derivatives, and computer vocabulary.

## Spelltronics

### Educational Activities

*System Requirements:* 48K, disk or cassette  
*Program Depth & Detail:* 7.0  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$70 disk  
\$60 cassette

Based on the "Cloze" spelling technique, this tutorial and drill program has a dictionary of 240 words that can be supplemented by the teacher or parent. The vocabulary demonstrates vowel and consonant patterns, word endings, and unlikely spellings of common phonemes.

In this instructional approach, the computer displays a common word with one or more missing letters. The student must supply the correct character to complete the term, then re-type the whole word in a context sentence.

**Spelltronics** gives the student a

second chance to complete the word, before correcting a wrong answer and advancing to a new word problem. The computer generates problem clusters with common traits, based on phonic similarities, linguistic roots, or underlying spelling principles.

Designed for fourth grade spellers, this software is appropriate for remedial learners of all levels and age groups (including adults).

The program is supplied on diskette (\$70) or in a set of three cassettes (\$60).

## Story Machine

### Spinnaker

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 7.5  
*Price:* \$50

So you want to grow up to be a famous story writer. So you'd like to write vivid, colorful episodes that tickle the funny bone and stir the imagination. Someday, you'll create stories so

real, so animated, they'll seem to be alive. When you write "The girl eats the rock," your readers will actually see a frantic female force down a fistful of feldspar. Why wait any longer? Want to be

the most magical wordsmith who ever hunted and pecked at a keyboard?

Inventive, versatile, frequently hysterical, **Story Machine** is an outstanding application of microcomputer power to elementary language development. This program has a vocabulary of words and phrases which it not only understands but also interprets into graphic animation. Type "The boy jumps into a tree," and by golly, a cartoon whippersnapper leaps up onto the crest of a billowing oak.

The idea is to exercise the child's creative processes and prospectively, develop compositional skills. The program's dictionary of legal words can be accessed from the main menu. If the child uses an illegal word — or creates an illegal sentence — the computer crosses out the mistake. Each word has its own syntax

unique to the story machine. For example, you can't have the girl eat the rock unless she's first standing right next to it. Otherwise, the smart-alec computer will tell you: "you can't do it from there."

Learning the syntax is one of the game's objects. The rules aren't quite the same as those in Strunk and White's **Elements of Style**, but the process of investigation is a valuable activity. The stories can be saved on diskette for future reruns.

Some children may find it frustrating trying to master the extremely limited vocabulary and inflexible sentence structure required to manipulate the story machine. The program provides good exercise in context spelling and inventive planning, but frankly, doesn't teach either English syntax or creative writing worth a hang.

## Toltec Pyramid

### *Educational Activities*

**System Requirements:** 48K, disk or cassette  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 7.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.0  
**Price:** \$60

The **Toltec Pyramid** is an interactive learning game that can be customized for specific levels of achievement. The student's alter ego is a silhouetted Toltec

warrior tasked with ascending a 20-to-50 level pyramid. The only way to advance the weary wanderer is to correctly answer a problem on agreement between

verbs and nouns, agreement between pronouns and verbs, prepositions, adjectives, adverbs, and noun-pronoun substitution.

A wrong answer hurls the vicious chieftan into the dreaded alligator pit. Enough correct responses, and the student

receives a quasi-animated "reward."

The instructor can construct a customized pyramid with as many as 50 problem sentences. The program is available on disk or cassette.

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## Type Attack

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*Sirius*

System Requirements: 48K, disk  
Program Depth & Detail: 7.0  
Value for Your Money: 7.5  
Support Availability: 8.0

Video Design & Clarity: 8.0  
Overall Efficiency: 7.5  
Documentation: 8.0  
Price: \$40

The methodology of attack is predictable. The alien characters will land in columns, descending in unrelenting waves on the virtually defenseless city. Humanity's last hope is you and your computer-controlled disintegrator. The first wave appears above the horizon, and you reach for the keyboard. But you barely know how to type...

Or else you wouldn't be playing **Type Attack**, an extremely engaging typing tutorial that provides variable practice in keyboard entry cloaked as a video action game. In this game, you don't aim any cannons or unleash any death rays. To destroy the invading characters, you simply

have to correctly type the one at the bottom of any column. The invasion takes place in waves of eight columns, so you've got to be quick to keep one or more from landing in the city.

You can specify the pace of the program to conform with your own level of typing proficiency. Of course, the attacking columns are designed to broadly exercise all the keys. Most everyone who sees this program in action is very impressed. It's a delightful first typing tool that avoids a lot of drudgery and overblown theory. The least attractive aspect is having to suffer through the little victory song and animation sequence whenever you win.

## U.S. Geography - Check Marc

Atari Inc.

System Requirements: 32K, disk  
Program Depth & Detail: 8.5  
Value for Your Money: 8.0  
Support Availability: 8.0

Video Design & Clarity: 8.5  
Overall Efficiency: 8.5  
Documentation: 9.0  
Price: Quoted by Vendor

Part of the Geo Terms series developed by Marc Ed, Inc. **U.S. Geography - Check Marc** teaches students basic social studies vocabulary with classroom compatibility in mind. The program is designed to be used in conjunction with a seventh to ninth grade classroom social studies curriculum.

**Check Marc** includes two sections, one that teaches and drills vocabulary words and a second game section designed to reinforce the knowledge gained in the first. Twenty-five sets of social studies terms are introduced in "Geo Key" where students learn to spell and recognize words and terms. Then the words are drilled as a keyboard is displayed on the

monitor screen with the word to be practiced. Students are motivated to concentrate on the word as speed and accuracy of the word they type receives a score.

"Blast Off" requires students to supply the missing letters in the twenty-five words studied in "Geo Key". An animated spaceship hovers over each letter in question adding an element of speed to the game.

Included for the teacher are reproducible student response sheets to match definitions with terms and a "map pac" of reproducible maps for associated lessons. **Check Marc** is simple and self-explanatory, requiring no prior computer experience.

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## U.S. Geography - High Marc

Atari Inc.

System Requirements: 32K, disk  
Program Depth & Detail: 8.0  
Value for Your Money: 8.0  
Support Availability: 7.5

Video Design & Clarity: 8.5  
Overall Efficiency: 8.5  
Documentation: 9.0  
Price: Quoted by Vendor

Designed to complement a classroom Geography curriculum, **U.S. Geography - High Marc** excels in instructional documentation and related materials for seventh to ninth graders. The second in a two part series, **High Marc** teaches geography vocabulary words and terms, reinforcing some from the first of the series, **Check Marc**.

Two modules use drill games along with colorful graphics, animation and sound to gain the interest and motivation of students. "Smash" is a game for one or two players requiring students to unscramble twenty-five terms, one at a time. Points are

given for each word successfully unscrambled, depending on the number of letters in the word.

"Teacher Base" allows the instructor to add his or her own choice of terms to the program. Simple instructions make it easy to add more than one thousand words, a facility becoming increasingly popular in educational software.

The documentation includes reproducible student response sheets and a "map pac" of reproducible maps designed to be used with associated lessons. The creativity of **U.S. Geography - High Marc** lies in its attempt to accommodate classroom learning.

## Using Phonics in Context

*Educational Activities Inc.*

System Requirements: 48K, disk  
Program Depth & Detail: 9.5  
Value for Your Money: 9.0  
Support Availability: 8.0

Video Design & Clarity: 8.5  
Overall Efficiency: 9.0  
Documentation: 9.0  
Price: \$150/4 disks

**Using Phonics in Context** offers a comprehensive phonics tutorial with a complete management system. Students learn phonics word attack skills in conjunction with reading comprehension in a highly user-interactive format.

Diagnostic tests initially determine the students reading level and unique strengths and weaknesses. Tutorials review and

evaluate student progress in a branching system that allows students to learn at a rate designed for their individual needs. The specific topics include initial consonants, final consonants, digraphs, blends, short vowels, long vowel patterns, irregular vowel patterns, and vowel plus "r" combinations, all in story or sentence context.

The management system makes

it possible for a teacher to review student progress, storing information on student performance as they work through the tutorials.

**Using Phonics in Context** is a classroom aid for grade levels 2-4, ESL, and Special Education.

## Vocabulary Builder 1: Beginning

*Program Design, Inc.*

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$24 disk  
\$19 cassette

This program is designed to enhance students' understanding of word meanings through interactive exercise with synonyms and antonyms.

In "Synonyms," the computer administers each problem by displaying a word accompanied by a list of possible synonyms. The student selects his answer from the list.

"Antonyms" follows an iden-

tical format, listing possible word opposites in a multiple-choice menu.

The drill is generated from a data base of 2000 words and 400 exercises. The computer can monitor the student's performance and produce a grade. A comprehensive vocabulary quiz serves as the denouement.

The program is designed for students in junior high school.

## Wanted

*T.H.E.S.I.S*

*System Requirements:* 16K, cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$15

A typical reinforcement spelling and vocabulary lesson, **Wanted** captures interest by presenting word clues on a "Wanted" poster and challenging the student to "track down the fugitive word".

Clues describe words in terms of their characteristics, part of

speech, accent mark, and number of syllables. The fewer clues required to guess the word correctly, the higher the student's score.

The selected word list is appropriate for fourth through eighth graders.

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## Webster: The Word Game

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CBS Software

System Requirements: 32K, disk  
Program Depth & Detail: 7.5  
Value for Your Money: 8.5  
Support Availability: 9.0

Video Design & Clarity: 8.5  
Overall Efficiency: 8.0  
Documentation: 8.5  
Price: \$25

**Webster** has the attributes of a standard word spelling drill and the production values of a finely crafted video game. Using a common "missing letter" exercise format, the program takes advantage of a clever graphics treatment to enhance the game's appeal and presumably, to boost motivation.

**Webster** draws on screen interaction rather than keyboard input: the player selects letters from an alphabet "menu," rather than pressing the corresponding keyboard characters. When the game is booted, the computer displays a partially spelled word at the top of the monitor. The object is to determine what letters the computer has omitted. The

child controls a "digital" cursor — in this case, a cartoon hand with real digits — to point to the correct letters in the alphabet display. When a player is completely stumped, he can prompt the computer for help.

Though the "icon" spelling approach simplifies the learning process for non-typing youngsters, it does little to cultivate keyboard familiarity. Console experience is an important ancillary benefit of any educational game, but is neglected in this case in favor of trendy "point-and-click" simplicity (this year's fad in software design).

This game offers variable levels of challenge with increasingly more sophisticated words. It's a

classy drill for beginning to intermediate spellers suitable for use in class or at home. The

vocabulary is well chosen and adequately bridges several ranges of entry-level spelling proficiency.

## Weird and Wacky World

### *Educational Activities*

**System Requirements:** 32K, disk or cassette  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$45 to \$98

This verbal skills module contains eight short stories to test reading comprehension, integrated with word meaning and practice drills. There are two versions of the program set: "Literal Comprehension: Reading with Understanding" and "Clinical Reading: Reading with Critical Understanding."

The program is little more than an electronic workbook, providing concise text displays followed by an automated sequence of multiple-choice questions. However, the content and

scope build nicely on the computer's inherent characteristics to motivate, animate, and personalize.

Each story is a humorous extract from common experience, providing exercises in fill-in-the-blank, look-alike, and Cloze formats.

The Literal Comprehension program is contained on a single floppy disk (\$50) or a set of four digital cassettes (\$45). The Critical Reading version is supplied on two floppy diskettes (\$98) or eight tapes (\$90).

## Wild and Crazy World

### *Educational Activities*

**System Requirements:** 32K, disk or cassette  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$55 to \$100

This engaging learning program consists of eight current events scenarios extracted from eccentric but real daily life. As a learning tool, this product must be classified as an electronic workbook — a "Weekly Reader" of humorous anecdotes applied to learning motivation and comprehension testing.

The stories cover a gamut of elementary topics, from alligator attacks to Rubik's Cube. Each story is followed up by a word meaning drill administered by the computer.

The software is supplied in two separate versions — one to exercise literal comprehension, the other to challenge critical reading skill. "Literal Comprehension: Reading with Understanding" is supplied on a single diskette (\$55) or a set of four cassettes (\$45). The companion, "Critical Reading: Reading with Critical Understanding," is based on the same eight stories but a more analytical approach, and is available on two floppy disks (\$100) or eight tapes (\$90).

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## Wiz Type

*Sierra On-Line*

System Requirements: 32K, disk  
Program Depth & Detail: 8.0  
Value for Your Money: 8.5  
Support Availability: 8.0

Video Design & Clarity: 9.0  
Overall Efficiency: 8.5  
Documentation: 8.5  
Price: \$35

The "Wiz" in **Wiz Type** is none other than the cynical namesake from the syndicated comic strip, "Wizard of Id." With exceptional graphics and splendid animation, this versatile training tool for the erstwhile typist is probably the strongest software product of the genre. Its prime ingredients include classy production values and an excellent lesson selection.

In concept, the program is an ordinary typing drill in which the trainee is challenged to replicate

text excerpts flashed on the monitor screen by the computer. Beginning with simple characters, the models become increasingly more sophisticated until the student is ready to undertake entire sentences and paragraphs.

The game is augmented by characters from the popular Johnny Hart comic strip. The typing drill is overseen by the cheer leading Wiz and his grumpy cauldron concoction, the Spirit. The latter serves as a kind of anti-hero: the worse your perfor-

mance, the more gleeful the Spirit. In contrast, it's the Wiz who chortles in delight when your typing speed and accuracy are adequate to the task. He rewards flawless proficiency by unleashing a magic spell to zap the unmanly Spirit. A running comic strip complete with punch lines is interwoven through the drill to egg you on.

For typing practice, **Wiz Type**

is supplied with a built-in repertoire of excerpts for varying levels of keyboard mastery and reading comprehension. The library of titles includes "Mother Goose," "Hamlet," and "The Cremation of Sam McGee," among others.

The program can be modified by the user or instructor to introduce new content words and sentences.

## **Wizard of Words**

*Opportunities For Learning, Inc.*

*System Requirements:* 32K, disk

*Program Depth & Detail:* 7.5

*Value for Your Money:* 8.0

*Support Availability:* 8.0

*Video Design & Clarity:* 8.0

*Overall Efficiency:* 8.0

*Documentation:* 7.0

*Price:* \$35

The **Wizard of Words** inhabits a mysterious realm where jugglers, heralds, knights, a princess, and a fire breathing dragon conspire to teach reading, spelling and vocabulary. With a wave of his wand, the wizard controls five different games shaped from a master dictionary of 20,000 words.

Help the knights of the realm build words a letter at a time on the castle facade, or make the magic juggler unravel his mystery of scrambled letters. Watch a dragon breathe words within a word, spin a crossword puzzle on a spinning wheel, or sound the

trumpets to uncover a secret word.

The teacher can add words to the program and tailor the games to any sophistication level.

**Wizard of Words** is well designed and supported by clever graphics. The games are mildly engaging, if not especially inventive. The problems are unlikely to challenge many minds, large or small, but at least this program presents information clearly and concisely in a manner that is visually appealing. The vocabulary is larger than some professional proofreading programs.

## Word Factory

*Opportunities For Learning, Inc.*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	7.5
<i>Value for Your Money:</i>	7.5	<i>Documentation:</i>	7.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$67

**Word Factory** is an electronic word grinding machine that accommodates four different games: Adding Prefixes, Fun With Suffixes, Let's Use Contractions, and The Rhyming Machine. In each game, the student must change words and create new ones according to what topic is currently being covered.

The teacher can enter new words to vary the type, length, and complexity of the games. Although it's a simple learning tool, **Word Factory** is a slow way to teach basic verbal skills. The program is cute and engaging, but not likely to hold a typical child's attention for prolonged periods.

## WORDGO

*APX*

<i>System Requirements:</i>	40K, disk; joystick	<i>Video Design &amp; Clarity:</i>	9.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.5
<i>Value for Your Money:</i>	9.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$25

A clever word game designed to increase spelling and vocabulary skills, **WORDGO** uses attractive graphics and sound to make the play glamorous and exciting. Excellent for use at home or in the classroom, **WORDGO** challenges students eight and older to recognize different ways that groups of letters go together to form words.

At the start of the play students choose one of two dif-

ficulty levels. This determines the type of letters that fill sixteen squares on the displayed "board"; letters such as "ank" or "ick". At the top of the screen a consonant blend is displayed. Students use their joystick to choose endings that will form a word with the beginning blend at the top of the screen. Choose four correct endings that line up horizontally, vertically, or diagonally to finish

a game. A definition is provided for any word upon request so students who are unsure but have guessed correctly have an opportunity to increase their vocabulary.

Students can play **WORDGO**

against their own score or in competition with an opponent. This is a well designed motivational learning game that effectively improves word building skills.

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## Word Scramble

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T.H.E.S.I.S

*System Requirements:* 16K, cassette; 24K, disk;  
8K additional required  
for Votrax Type N'Talk

*Program Depth & Detail:* 8.5

*Value for Your Money:* 9.0

*Support Availability:* 7.5

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$20 cassette  
\$25 disk

This versatile program is an excellent reading and spelling aid for grades one through four. Equipped with five word lists, the data base can be easily modified by the user to reflect specific curriculum objectives or individual learning speed.

As is typical of this genre, a crudely drafted robot proctor administers each drill by printing a scrambled word on the monitor

screen in oversized characters.

The child deciphers each word at his own pace, using the keyboard to enter his answer on the screen. The gregarious gear-head shakes his head "yes" or "no" in response to each entry.

By adding the Votrax Type-N-Talk to the system, you can equip your redoubtable robot with the gift of speech (if you dare).

## Word Scrambler/Spelling Tutor

*Opportunities For Learning, Inc.*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	7.0
<i>Program Depth &amp; Detail:</i>	7.0	<i>Overall Efficiency:</i>	7.5
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	7.5
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$20

Two spelling tutorials with three levels of sophistication are contained on a single disk. One level is designed for children in kindergarten through third grade. Another is suited for grades four to eight, and a more advanced word list challenges junior high and high school students.

**Word Scrambler** is a kind of flash card drill in reverse. The

computer displays a jumbled array of letters from which the student must construct a real word. **Spelling Tutor** provides repetitive exercises with ample practice in re-typing misspelled terms.

The instructor or parent can add to the word list to tailor the disk to special needs, subject categories, or aptitudes.

## Wordgames

*MECC*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	9.0
<i>Program Depth &amp; Detail:</i>	9.5	<i>Overall Efficiency:</i>	9.0
<i>Value for Your Money:</i>	9.5	<i>Documentation:</i>	9.5
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$45

This disk contains three concise learning games focusing on spelling and vocabulary. In addition, a customization utility permits instructors to modify the games for individual requirements and objectives.

“Recall”, “Scramble”, and “Guess Word” are the games, and “List Maker” is the menu-driven management program. The instructor determines what words

are to be taught in all three games. The computer will record the number of word problems to which each student responds, note the number spelled correctly, and prescribe a list of words that need to be reviewed.

“Recall” challenges the student’s visual recall. The computer will flash a word on the monitor for a brief instant, challenging the player to recall

and spell it correctly. The length of the display is predetermined by the instructor or parent. "Scramble" gives the student four opportunities to unscramble letters on the screen to form a word. "Guess Word" is a variation

on the familiar Hangman theme based on word meanings.

Owing to its malleable construction, this program can accommodate a wide range of student levels.

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## Wordmate

T.H.E.S.I.S

*System Requirements:* 48K, disk;  
16K, cassette  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$20 cassette  
\$25 disk

Play "Wordmate" against the computer. Match your words with the computer's words to make a compound word. Try to form more compound words than the computer and not end up with the last word!

Designed like a card game, this interactive program provides ten word lists (100 words in all) deemed appropriate for third through sixth graders. The disk

also contains a customization utility for supplementing the master dictionary to meet individual curriculum or student objectives.

Words are displayed in oversized, graphic letters with phonetic accompaniment. **Wordmate** can be used with Votrax Type'N'Talk, allowing children to hear each word as it appears on the screen.

# Writing Competency

## Educational Activities

*System Requirements:* 48K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 7.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$80

Written by Carol Butcher of the New York Public School System, this tutorial series covers basic skill areas in letter writing, report organization, and persuasion.

Brief computer lessons in an electronic workbook format are integrated with video reinforcement. A crude pencil-shaped stick figure stars as the lesson proctor, pointing out concepts in on-screen examples. The program attempts to provide a complete, self-contained course in basic high-school level writing.

A section on business letters offers stylistic examples of correspondence for requesting information and documenting a complaint. The animated pencil-proctor guides the student through a mini-tour of the letter's basic components, content, capitalization, and punctuation. He

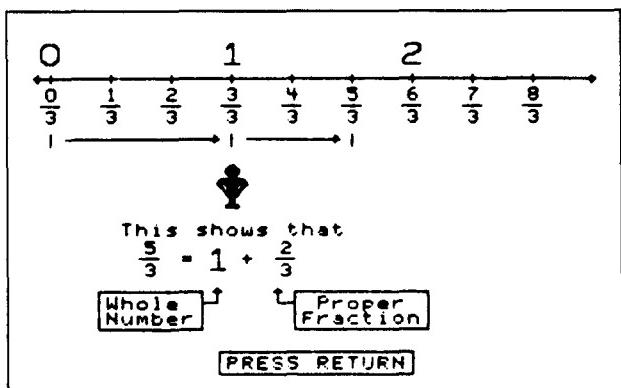
also discusses techniques of writing for a specific audience, including the use of tone to add impact.

A second section is devoted to organizing a report. The erstwhile eraserhead demonstrates organizational formats, outline techniques, and the principles of unity and coherence. An additional tutorial discusses the art of persuasion, with emphasis on factual argument and supportive research.

Each lesson is appended by a question-answer session to evaluate the student's comprehension.

A lucid teacher's manual accompanies the software. Despite the laughable graphics, this tutorial is well paced and efficient, delivering its content in ample depth without extraneous bells and whistles.

# Math Education



Arithmetic Classroom — Sterling Swift

## Addition With Carrying

PDI

*System Requirements:* 16K, cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

An addition drill featuring colorful graphics and interesting sound effects, **Addition With Carrying**, reinforces learned rules of two-column addition.

A tutorial section reviews the process of carrying, requiring students to participate in a step-by-step demonstration. Student interaction is prevalent throughout this program and in

the drill section constant feedback is supplied with sound effects. At the end a tally of right and wrong answers is presented with visual and sound effect congratulations appropriate to performance.

**Addition With Carrying** is recommended for elementary school children, second grade and older.

## AlgiCalc

Atari

*System Requirements:* 16K, cassette; 24K, disk;  
*Atari BASIC*  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.0  
*Price:* \$25

**AlgiCalc** is a formula tool that quickly computes the results of simple Algebraic expressions. Although the program is a far cry from being an elaborate tutorial, it does provide a succinct visual demonstration of the calculations carried out to solve each expression.

You might think of this product as an electronic scratch pad

with built in number crunching powers. To run the program, you need the Atari BASIC cartridge inserted in the ROM slot. When **AlgiCalc** is booted, the screen provides a work area for keying in your formula. You can only solve one expression at a time, although you can use a current result as a factor in a second expression.

**AlgiCalc** is a useful tool for Algebra students, engineers, and statisticians, structured for convenient factoring and differential operations. You could easily render your equations in BASIC

yourself, but this program presents a tidy format with a clear visual organization that will be appreciated by students and educators alike.

## Alien Addition

Atari Inc.

System Requirements: 48K, disk

Program Depth & Detail: 8.0

Value for Your Money: 8.0

Support Availability: 8.0

Video Design & Clarity: 9.0

Overall Efficiency: 8.0

Documentation: 8.0

Price: Quoted by Vendor

**Alien Addition** is an interactive, arcade-type space game that drills addition pairs of numbers 0 - 9.

The screen monitor displays a laser cannon protecting a planet from invading starfighters. Each ship hovers ominously above the cannon wearing the insignia of an addition problem. Typing the correct answer activates the cannon and blasts the alien off the screen. "Hits" and "misses" are displayed on the cannon platform during play.

One of the popular series, "Academic Skill Builders", **Alien Addition** is recommended for grades four through seven.



## Alligator Mix

Atari Inc.

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.5  
**Overall Efficiency:** 8.0  
**Documentation:** 8.0  
**Price:** Quoted by Vendor

Imaginative graphics and animation motivate children to practice addition and subtraction facts in this "Academic Skill Builder." The program offers progressive difficulty levels and

constant feedback for children in grades four through seven.

The play involves feeding purple apples to hungry green alligators in a swamp. Each apple is a sandwiched addition or subtraction problem. As it floats past alligators in the swamp, children pick the alligator corresponding to the correct answer. The gregarious gator yawns widely and downs the problem, apple and all.

Apples float past faster and alligators become more numerous as the player's skill level improves, creating a challenge level appropriate for the individual. "Hits" and "misses" are recorded in the swamp grass, providing a continuous feedback stream.



## Arithmetic Classroom

Sterling Swift

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 7.5  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$50 each

In the center of the screen stands a silhouetted robot, hands on hip like a glowering proctor. In the margins, a sparse lesson appears in broken sentences, accompanied by a crude diagram. Press the RETURN key and the robot motions toward an arithmetic problem. Now you key in the answer.

You'll please the expressionless robot-headmaster if your answer is right. In fact, to reward you for your proficiency, he'll dance a preposterous jig.

Ignoring the dubious graphics quality and laughable reinforcement technique, **Arithmetic Classroom** is a competent and comprehensive learning series for the institutional setting. The series is adapted from Sterling's **Elementary Mathematics Classroom Learning System**, a widely used lesson plan for computer-aided arithmetic instruction. The complete set consists of eight separate programs and three games. The learning programs include the following titles:

- Addition
- Subtraction
- Multiplication
- Division
- Fractions: Basic Concepts
- Fractions: Addition & Subtraction
- Fractions: Multiplication & Division
- Decimals.

The educational modules adhere to the robot-proctorial approach described above. The games are inventive, highly

motivating scenarios that apply the student's newly acquired know how to arcade-like challenges.

The tutorial approach is based on a series of modular, objective-based lessons with pictorial examples. Practice problems follow each tutorial episode. Whenever the student enters a wrong answer, the program offers a suggestion on how to correctly solve the problem. As for positive reinforcement, if a wiggling robot echoing your name strikes glee in your heart of hearts, so much the better.

Each learning package contains a lesson diskette, a practice workbook, and a set of achievement record forms to keep track of learning progress. The programs were developed by a team of educators from Penn State with a background in autotutorial concepts.

The three games are somewhat more engaging. **Slam Dunk Math** is a rapidly paced court competition in which a player must quickly solve arithmetic problems to score. An equally demanding action game, **Space War Math** challenges students to shoot down alien arithmetic problems by firing the correct solution. In **The Gong Show**, players must successfully solve math problems to "gong" contestants from the screen.

Each learning module is priced at \$50. The three games are included on a single diskette for \$29.

## Basic Arithmetic

MECC

System Requirements:	48K, disk	Video Design & Clarity:	9.0
Program Depth & Detail:	9.5	Overall Efficiency:	9.0
Value for Your Money:	9.0	Documentation:	9.5
Support Availability:	8.0	Price:	\$45

Elementary school students sharpen their skills and others review using **Basic Arithmetic**, a program featuring six lively learning games and an in-depth approach to understanding essential arithmetic concepts. Base ten, estimation, rounding, and making change become the content of games enhanced with excellent Atari graphics and sound in an educational framework that offers plenty of user-interaction and constant feedback.

An engrossing space game motivates children to use learned tools of multiplying numbers that are multiples of ten. A portion of the galaxy is displayed on the monitor screen with a spaceship in the lower left hand corner. Black holes, vapor clouds, danger zones, and asteroids block the ship's route. Speed, accuracy, and sense of direction are necessary to move the ship across the screen, as students are challenged to solve problems such as " $40 \times 300 =$ ", and then determine whether they need to move north, south, east, or west to safety.

A simulation of a cashier's job provides an entertaining setting for children to practice making the correct change in "Change". "Estimate" gives multi-leveled practice in estimation. Students choose either addition, subtraction, multiplication, division, or percentage problems, a time limit of 5 - 3 seconds, and a difficulty level designated by the number of digits in the problem. "Round" provides practice in rounding numbers. "Speed Drill" is a series of basic fact problems timed and at a difficulty level chosen by teacher or student.

"Math Game" would be excellent in Classroom competition. Students choose either addition, subtraction, multiplication, or division, give their age and difficulty level and the computer determines the type of problems and the number of bonus points to be awarded.

"Basic Arithmetic" provides teachers with a fifty-four page support manual and student handout pages.

## Battling Bugs/Concentration

*EduFun*

**System Requirements:** 16K, cassette; 32K, disk  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 7.5

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.5  
**Documentation:** 8.0  
**Price:** \$30

Two learning games teach and reinforce the mathematical concepts of positive and negative numbers and equivalent fractions. Amusing and colorful graphics, sound, and an entertaining game format encourage children to become knowledgeable in these concepts in the process of play.

“Battling Bugs” takes place on a monitor display “battlefield” as menacing troops of red and black bugs approach each other from opposite sides of the combat field. As they meet in the middle bugs that collide disappear, never to be seen again. The remaining bugs continue to march forward toward the opposite teams goal. That team must add the bugs in the column and set this many more of his team against them. Simple as it may seem, this is

analogous to number line theory and could help students in conceptualization of positive and negative numbers.

“Concentration” uses the classic game of the same name as a format for recognizing equivalent fractions in either pictures or symbols. Any equivalent pair when turned over on the monitor display “board” counts and allows the player an additional turn. There are twenty fractions in all with ten matching pairs.

**Battling Bugs/Concentration** is recommended for ages nine to twelve, when intermediate elementary students are learning these concepts in the classroom. The package comes with reusable game cards to reinforce the concepts learned in the classroom and on the computer.

## Beginning Algebra

*Program Design, Inc.*

**System Requirements:** 32K, disk  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 8.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$120

Starting an algebra course with no exposure to its basic concepts can prove difficult for some students. This program attempts to make it a little less confusing, reducing critical concepts into atomistic portions:

- mathematical sentences
- variables
- terms

- exponents
- signed numbers
- number lines
- solving simple equations.

A voice cassette explains concepts displayed on the screen. The software is also accompanied by a glossary of common terms and a set of student work sheets.

## Bumble Plot

*The Learning Company*

*System Requirements: 48K, disk  
Program Depth & Detail: 8.5  
Value for Your Money: 8.5  
Support Availability: 8.5*

*Video Design & Clarity: 8.5  
Overall Efficiency: 8.5  
Documentation: 8.5  
Price: \$60*

This classic learning set uses imaginative themes and engaging graphics to ease early arithmetic students into a few abstract concepts. **Bumble Plot** consists of five scenarios starring an amiable green alien from whom the program derives its title. Bumble leads the child from elementary spatial relationships to number plotting in simple, interactive steps.

On the surface, the lessons seem to have more playing than learning going on, but at the very least they're captivating, concise, and highly motivational. "Trap and Guess" is a semi-animated adaptation of the old "Guess the Number" BASIC program. The child tries to "trap" an unknown

integer by entering high and low guesses. In this version, the answer might be either positive or negative.

In "BumbleBug," the student has to plot a point on a graph to catch a randomly hopping "bug." The remaining games, "Hidden Treasure, BumbleArt," and "RoadBlock," carry on in similar fashion, gradually increasing the complexity of the child's plotting tasks. Each game progressively applies what the student has learned in the previous games. Ultimately, the child must plot both positive and negative numbers to help Chief Bumble trap a getaway car.

**Bumble Plot** is thoroughly charming yet subtly clever. Unlike

many "educational" game packages for elementary age groups, this ingenious set is a true, modular instruction system — not merely an overblown exercise

drill. All the games are building blocks in a progressive architecture that culminates in a clearly defined instructional objective.

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## Calculus Demon

Atari

*System Requirements:* 16K, cassette; 24K, disk,  
Atari BASIC  
*Program Depth & Detail:* 7.5  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$25

**Calculus Demon** is a handy formula solver structured specifically to compute indefinite integrals, partial derivatives, and logarithms. Besides automating lengthy computations, this program offers a convenient format for entering and reviewing equations and problems on the monitor screen.

The Atari BASIC cartridge must be in your computer's cartridge slot as you boot the program. The screen becomes your scratch pad for defining equations. You can enter expressions

of almost unlimited complexity. Besides integration and derivatives, **Calculus Demon** supports trig functions and logarithms.

This program is a bona fide boon for statistical, laboratory, and educational applications requiring calculus. Unfortunately, it lacks a graphics option for visualizing indefinite integrals or plotting surfaces of revolution. Nonetheless, **Calculus Demon** is virtually the only product of its kind and, as such, an indispensable calculus companion.

## Compu-Math: Decimals

Edu-Ware

System Requirements: 48K, disk; 32K, cassette  
Program Depth & Detail: 8.5  
Value for Your Money: 8.0  
Support Availability: 7.5

Video Design & Clarity: 8.5  
Overall Efficiency: 8.5  
Documentation: 9.0  
Price: \$40 disk  
\$30 cassette

An autotutorial designed for independent study, **Decimals** is easily used by students in the third to sixth grades who have a grade-level knowledge of basic arithmetic and fractions. Amusing graphics and animation enhance the presentation of learning material divided into seven major skill areas. Constant feedback, performance evaluation, and comprehensive documentation complete this two-disk package.

The subject areas covered include: Definition and Decimal/Fraction Conversion, Addition -stressing placement of trailing zeros and carrying columnar values, Subtraction, Rounding

Off, Multiplication - emphasizing correct decimal point placement, Division - reviewing basic long division first, and Percentages.

Students starting **Compu-Math: Decimals** take a pre-test that determines their current skill level and places them in a section appropriate to their skill level. There the student follows a lesson plan that delineates learning objectives for the lesson, teaches concepts, gives exercises for practice and further understanding, and finally tests to make sure that learning has taken place.

The documentation instructs teachers or parents in possible formats for home or classroom utilization.

## Compu-Math: Fractions

Edu-Ware

System Requirements: 32K, cassette; 48K, disk  
Program Depth & Detail: 8.5  
Value for Your Money: 8.0  
Support Availability: 7.5

Video Design & Clarity: 8.5  
Overall Efficiency: 8.5  
Documentation: 8.5  
Price: \$30 cassette  
\$40 disk

One of the **Compu-Math** series, **Fractions** teaches intermediate elementary students fractions from an introductory level. Amusing animation, concise graphics, and plenty of user-interaction encourage students to use this program independently to build or reinforce their math skills.

Six major areas are covered in the "Learning Units": Definitions and Parts of the Fraction, Denominators (introducing the concept of equivalent fractions, finding the lowest common denominator, and reducing), Addition, Subtraction, Multiplication, and Division.

A pre-test at the beginning of the program effectively determines a student's current level of knowledge and directs him or her to the appropriate Learning Unit. Each Learning Unit contains an introduction and statement of lesson objectives, a tutorial section that demonstrates, defines, and explains the concepts to be learned, drill and reinforcement exercises, and a post-test that evaluates student progress.

The documentation suggests ways that teachers or parents can use **Compu-Math: Fractions** in a learning framework for individual students or in a classroom situation.

## Demolition Division

Atari Inc.

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.0

*Value for Your Money:* 8.0

*Support Availability:* 8.0

*Video Design & Clarity:* 8.5

*Overall Efficiency:* 8.0

*Documentation:* 8.0

*Price:* Quoted by Vendor

This learning game adds fresh meaning to the phrase "Divide and Conquer." Tanks and cannons are engaged in a suspenseful battle that can only be won by division — division math problems, that is. Children in grades 4 to 7 man the cannons and try to answer the problems inside each attacking tank. A correct answer rewards the child by blasting away an enemy tank. A running total of hits and misses is record-

ed in bunkers at the bottom, providing a constant feedback stream for their division battle efforts.

**Demolition Division** is an "Academic Skill Builder" using imaginative graphics, animation, and sound in a motivational arcade game format. Motivation and practice are the key to success in memorizing arithmetic facts and this program provides an inviting milieu for both.

## Division Drill

Atari Inc.

*System Requirements:* 24K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 7.5  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.0  
*Documentation:* 8.0  
*Price:* \$30

**Division Drill** adds a new twist to learning math skills — music. Correct answers are “rewarded” with a computer melody; wrong responses are greeted with a low somber tone.

A PreTest, Drill, and PostTest assist in the design of custom drills for individual needs. In the PreTest mode, students select the number of problems they wish to solve and the time limit in which

to complete them. In Drill mode, the computer offers up three problems; to advance to a higher level of difficulty, the student must correctly answer all three.

The PostTest summarizes all of the previous exercises and records the progress for the session.

The instructor can change the difficulty level to suit specific requirements, class focus, or individual proficiency.

## Dragon Mix

Atari Inc.

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

Children help a noble dragon protect a kingdom from attacking enemies while practicing their multiplication and division facts in **Dragon Mix**. The ferocious green dragon wears a changing number insignia and can only charge those invaders with an equivalent insignia in the form of a multiplication or division problem. When an enemy invader

with the correct problem gets past the dragon, the player sees part of the kingdom collapse. The progress of the battle is recorded at the bottom of the screen.

**Dragon Mix** is part of the “Academic Skill Builder” series designed to remove the drudgery from arithmetic drill. This program features a mixture of multiplication and division prob-

lems at increasing skill levels. Requiring students to look first at a number and search for possible equivalent combinations creates a

learning process where students are involved with more than one answer at a time.

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## Estimation Skill Builder - Whole Numbers

*Edusoft*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.0  
*Price:* Quoted by Vendor

Test your computational skills in addition, subtraction, multiplication, and division by estimation. Only a correct solution to the problem will get you a bull's eye from the little man in the corner who shoots an arrow, recording on target the accuracy of your answer.

At the beginning of each game, the player can choose one of the four computational skills (addition, subtraction, multiplication, or division) at a beginning, intermediate, or expert level. There's a 25-second time limit on estimations, and the student receives a bonus point for every

second not used.

Even the lower levels of difficulty are decent challenges; for instance, in Level 1 a student will encounter problems like  $6 \times 65277$  and  $52309 - 47440$ . This is a rapidly paced exercise drill, with no hints, reinforcing branch routines, or tutorial discussions.

Capable of accommodating two or more players in a competitive setting, this product is a good motivational program for practice on rounding numbers and estimating solutions. The program is designed for students at upper grade school level or older.

## Figure Fun

*Thorn EMI*

*System Requirements:* 16K, cassette; joystick  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 7.5  
*Documentation:* 8.0  
*Price:* \$30

Two well developed learning games give children in upper elementary grades and junior high practice in finding prime numbers and the next number in a number series. Both games are interesting and fun, including motivational factors of speed and reward at different difficulty levels.

“FizzBuzz” is based on the traditional game of the same name and is an excellent exercise for learning and understanding the concept of prime numbers and the lowest common denominator. “Fizz” and “Buzz” both receive a number at the beginning of the game, for example “Fizz” = 3 and “Buzz” = 5. Starting at number one, consecutive numbers flash on the screen. Using a joystick the student selects “Fizz” if the number is divisible by 3 or “Buzz” if the number is divisible by 5. “FizzBuzz” means the number is divisible by both and is therefore a common denominator.

Two players play at a time. A

life is lost for each incorrect answer and each student gets five lives in all. The player reaching the highest number before losing all his or her lives wins the game. “FizzBuzz” has several variations of play including speed variations, for continual challenge and test of skill.

Colorful graphics, animation, and sound enhance “The Train Game”, designed to give students practice in finding the base of a numeric series. Nine types of series are used, including division, multiplication, and cubes, in five difficulty levels. Points are awarded for the number of series correctly solved in sixty seconds. The game is challenging and engaging as trains move across the screen, carrying the numbers in the series.

These traditional learning game exercises, enhanced by a computer audio-visual milieu, are excellent material for learning and reinforcing important mathematical concepts.

## Fraction Fever

*Spinnaker*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	7.5	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$35

In **Fraction Fever**, you're a pogo pro on the prowl for propitious proportions. First, you see a fraction elevated on high. Then you hop vicariously across the screen, on the lookout for a numerical equivalent. When the right one comes along, you've got to hop to the occasion.

This fast-paced learning game is based on quick response and rote behavior. The object is to identify fractional equivalents and squash the mismatches. The more

equivalents mastered, the more difficult the job. The player is literally elevated from plateau to plateau as he demonstrates proficiency. The more mismatches he squashes, the higher his point score.

To add "fever" to "fraction," the game is a race against time.

**Fraction Fever** is a highly imaginative, frequently frivolous learning tool with a sound structure and good graphic representation.

## Frenzy and Flip Flop

*EduFun*

<i>System Requirements:</i>	16K, disk or cassette
<i>Program Depth &amp; Detail:</i>	7.5
<i>Value for Your Money:</i>	8.0
<i>Support Availability:</i>	8.0

<i>Video Design &amp; Clarity:</i>	8.0
<i>Overall Efficiency:</i>	8.0
<i>Documentation:</i>	7.5
<i>Price:</i>	\$40

This popular motivational arithmetic package includes two games, "Frenzy" and "Flip Flop," accompanied by a set of reproducible work sheets for use by pupils and a brief teacher's guide. Though the programs have no real instructional objectives, they are engaging, highly interac-

tive, and capable of captivating a child's attention for prolonged periods.

"Frenzy" pits a famished alligator against a helpless school of nervous bit-sized fish consigned to the custody of the player. To avoid the natural consequences, the child must successfully solve

all the subtraction and division problems tossed his way.

In "Flip Flop," the student analyzes a pair of geometric designs composed by the computer. Using key commands, the player flips, flops, rotates, and slides both shapes until their contours are identical.

Meanwhile, the program silently records the player's performance for review later on. The instructor can glimpse the accuracy rate by entering a secret code word.

Charming graphics and mercifully adjustable sound effects contribute to the captivation.

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## Golf Classic and Compubar

*EduFun*

*System Requirements: 16K, disk or cassette  
Program Depth & Detail: 8.0  
Value for Your Money: 8.0  
Support Availability: 8.5*

*Video Design & Clarity: 8.0  
Overall Efficiency: 8.0  
Documentation: 7.5  
Price: \$40*

This disk contains two interesting games with tutorial slants — a challenging "Golf Classic" strategy game and a rudimentary addition/subtraction demonstration called "Compu-bar." The games are accompanied by a set of 24 reproducible work sheets for use by players and a teacher's support booklet.

"Golf Classic" is not only a practical and highly motivational arithmetic exercise, but it's not bad entertainment either. In graphic content and general strategy, it resembles the more ambitious "tournament" golf packages marketed by big-time game producers. The player studies the golf course layout to determine the correct angle and distance from the tee to the

green. Each shot must be maneuvered between sand traps and water hazards, based on the variables input by the player.

"Compu-bar" demonstrates equivalents and sums by displaying bars on a graph. The player successively adds and subtracts from the graph until the number of bars equals the length of a Total bar.

The child's performance is monitored by the computer and stored for future analysis. By entering a code word, the teacher or parent can glean the pupil's accuracy or proficiency rate. Above average production values, including charming graphics and adjustable sound effects, augment an engaging forum for early learning.

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## Graphing

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MECC

**System Requirements:** 48K, disk; joystick  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 9.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 9.0  
**Overall Efficiency:** 8.5  
**Documentation:** 9.5  
**Price:** \$45

Use **Graphing** as an instructional tool in the classroom, as educational drill, and entertainment. Six programs provide this wide variety of functions, all designed to teach pre-calculus graphing concepts to high school students.

The first three programs — “Slope”, “Polygraph”, and “Polar” — utilize the graphic capabilities of the computer and eliminate the work of tedious point by point plotting. Excellent for classroom demonstration these three programs take algebraic equations in varying degrees and plot their curves, allowing students to see the relationships of terms and exponents on a two-dimensional plane.

The fourth program reinforces

graphing techniques by requiring students to find a hidden “snark” whose location must be determined by a set of polar coordinates and a circle radius.

The actions of two missiles in “Radar” and “ICBM” are simulated on a radar screen. Students again must determine the direction their defending missile must travel using knowledge of both polar and vector coordinates, in order to intercept the enemy ICBM.

Graphing of linear and exponential equations are powerful concepts that must be visualized to be fully understood. In **Graphing** the computer becomes an imaginative and practical milieu for this study.

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## Graphing Exponential Functions

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Educational Activities Inc.

**System Requirements:** 32K, disk  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 8.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.0  
**Price:** \$20

**Graphing Exponential Functions** teaches the subject in a standard autotutorial format. Lessons include both tutorial and drill with a predominately user-interactive orientation. The computer monitors student progress through their response and when indicated re-explains and reviews material. Correct response to drill questions is graphically rewarded.

Initially students are presented with a review of the fundamental

rules of exponents, including definitions and techniques of computation. The computer displays an X and Y axis on the screen and conducts a graphic demonstration of exponential plotting.

Recommended for students in junior and senior high school, the program provides adequate coverage of the underlying concepts of exponents and the graphing of exponential functions.

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## Gulp/Arrow Graphics

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*EduFun*

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

This package consists of two program games, "Gulp" and "Arrow Graphics," with 24 reproducible work sheets and teacher's support material. Each game provides repetitive exercise in a light-hearted drill supported by engaging visual designs.

The "Gulp" game is an elementary addition and multiplication session disguised as an aquarian survival chase. A big fish chases a little fish as the pupil endeavors to solve basic

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$35

arithmetic problems.

"Arrow Graphics" is a subtle exercise in problem solving and spatial relationships, challenging the learner to correctly program the itinerary of a bouncing arrow.

As the player tackles a fishy multiplication table or deduces the direction of a feathery flight, his performance is logged by the program for future analysis and reporting. The results can be accessed by a user-definable code word.

## Integers and Integer Fast Facts

*Edusoft*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 8.5  
*Support Availability:* 7.5

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

**Integers and Integer Fast Facts** is a two part tutorial and practice program on the computation of negative and positive numbers. Lacking some in the creative possibilities of a computerized audio-visual milieu (animation, sound, and interesting graphic presentation) it is motivational on a user-interactive and immediate response basis.

“Integers” teaches addition, subtraction, multiplication, and division of negative and positive numbers. The student can choose a practice or ten-problem format. The program responds to the students ability by responding to two wrong answers in a row, carefully tracing through the problem using the number line. Special attention is given to subtraction problems where the computer shows the student how to change the problem to an addition problem. The student continues on the same level until mastery and then is moved to the next level. While working the stu-

dent can access a number line by typing the letter N or get a review of the multiplication and division rules by typing R.

“Integer Fast Facts” drills the rules on positive and negative numbers using small integers. There are three game formats the student can choose from involving one player to a team format. For each game the players are given the option of addition, subtraction, multiplication, division, or assorted problems. For one player playing the same game format, the program automatically keeps track of both the best and most recent scores motivating the student on a self-improvement level.

These programs are appropriate for students who have been introduced to the concepts of positive and negative numbers and need either practice or review. It would be a very good home tutorial for students having trouble with these concepts.

## The Market Place

MECC

*System Requirements:* 16K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 9.0  
*Price:* Quoted by Vendor

An engrossing educational game simulation, **The Market Place** teaches math, business, and economic concepts to third through eighth graders. Colorful graphics and a particularly imaginative game structure make this program a valuable motivational tool in an instructional framework.

Four games simulate "the market place". "Selling Apples" requires the student to determine the most profitable price at his or her own personal apple stand given daily fluctuations in demand. The optimum price is randomly generated with each play for a continual challenge.

While determining how much to spend on signs for advertising and comparing these costs with

profits, students play at determining the most profitable level of advertising, in "Selling Plants".

Six students at a time man lemonade stands in "Selling Lemonade". The focus in this game is production costs and how they effect the profit picture as the random effects of the weather play a part in the lemonade business.

Numerous factors are introduced in the last game "Selling Bicycles". Students reckon with interest charges, warehouse costs for remaining inventory, labor strikes, distribution breakdowns, and Presidential price freezes.

**Market Place** effectively challenges students to consider the many factors influencing economics and business.

## Math Conqueror

### Educational Activities

*System Requirements:* 48K, disk or cassette  
*Program Depth & Detail:* 7.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$35 disk  
\$25 cassette

The alien Problem Ships descend in merciless hordes, and the planet's only defense is your computer-operated missile launcher. Every invader has a math problem, and the only way you can shoot it down is to type the correct answer in time. Your missile launching tank moves horizontally across the screen, challenging your reflexes and aim as well as your math skill and typing prowess. One slip, and the aliens rack up points.

These fast-paced exercise drills cover elementary addition, sub-

traction, multiplication, and division to four figures. The subject matter can be pre-selected by the student or instructor, and the computer saves each player's score for comparison with the rest of the class.

As arithmetic missile games go, this is one of the better versions — offering relatively good production values and a decent repertoire of problems. Designed by Dr. Richard Rothenberg at Farleigh Dickinson University, this program is recommended for third to sixth graders.

## Mathematics Courseware, Plane Geometry

*Educational Courseware*

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 8.0  
**Support Availability:** 7.5

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.0  
**Documentation:** 7.0  
**Price:** Quoted by Vendor

Though not a comprehensive course in Plane Geometry, these two disks do cover the major definitions, postulates, and proofs of an introductory high school geometry course. The software is supplied with a student workbook and is password protected for maintaining the results of individual students work on an ongoing basis.

The format is consistently interactive, intermingling response-based tutorials with practice drills. The computer corrects in-

correct responses as soon as they occur, but does not branch to reinforce problem learning areas.

The tutorials are illustrated with standard graphics similar to geometric drawings found in textbooks. Each section concludes with a review quiz, glossary, and cumulative test.

Plane Geometry Disk One contains the following "chapters" in its menu: 1) Instruction, 2) Elements of Geometry, 3) Angles, 4) Intersecting Lines, 5) Cumulative Test, 6) Glossary, 7) End of

Test. Disk Two Chapters are:  
1) Instructions, 2) Parallel Lines,  
3) Triangle (Numerical), 4) Tri-  
angle (Theorems), 5) Cumulative  
Test, 6) Glossary, 7) End of  
Lesson.

This product is a well-written autotutorial that could be used effectively in computer assisted classroom instruction or as a home tutorial.

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## Math Facts and Games

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*Atari Inc.*

*System Requirements:* 16K, disk

*Program Depth & Detail:* 8.0

*Value for Your Money:* 8.0

*Support Availability:* 9.0

*Video Design & Clarity:* 8.0

*Overall Efficiency:* 8.5

*Documentation:* 8.0

*Price:* Quoted by Vendor

This program for elementary school students is aimed at improving basic math skills through motivational game formats. Individual sessions exercise addition, subtraction, multiplication and division with varying levels of optional difficulty.

“The Count Down” gives students thirty seconds to solve as many problems as possible. The computer corrects wrong answers and awards points for right ones.

“The Secret Word” challenges students to identify math related terms. The computer starts the game by displaying the first letter

in a secret word and producing a character count. To earn clues, the student must successfully solve an arithmetic problem.

Similarly, players must correctly solve problems to gain control of a square in “Tic Tac Toe.” A fourth learning game, “Computer Challenge” pits the student one-on-one against the computer in a rapidly paced exercise drill.

The games are augmented by competent graphics. Though elementary in scope, this selection offers a sound tool for the slow arithmetic learner.

## Meteor Multiplication

Atari Inc.

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

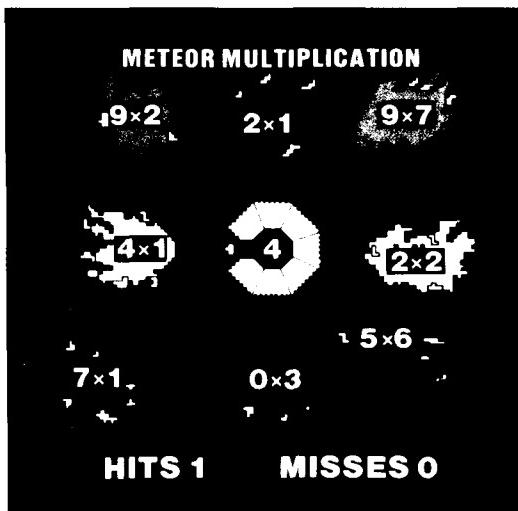
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

Solve multiplication problems to keep meteors from demolishing your star station. Dangerous meteors surround the station, each with their own multiplication problem. Only your knowledge, speed, and shooting accuracy will save you.

This "Academic Skill Builder" provides a highly motivating form for random-access multiplication drills. A continual record of correct and incorrect answers is displayed at the bottom of the monitor screen; the game progresses at increasing levels of difficulty based on the player's performance.

Hand-eye coordination and fast reflexes are as crucial to victory

as a competent grasp of elementary math facts. The game is best suited for fourth through sixth graders.



## Metric & Problem Solving

MECC

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 9.0  
*Documentation:* 9.0  
*Price:* Quoted by Vendor

Seven challenging learning games enhanced with amusing graphics and sound captivate the imagination while teaching skills in metric measurement and problem solving. Children ages seven to twelve become engrossed in their own learning process, using deductive logic and learned math skills as strategy for success in **Metric & Problem Solving** by MECC.

Logic is required in "Bagels" to guess a two-, three-, or four-digit number from clues given by the computer in a secret language code. "Hurkle" is the name of the game and a little creature who plays 'hide n'seek' with children on a grid or number line. In order to find him children must identify his position by using direction and map reading skills.

A metric tutorial game teaches estimation of lengths in centimeters and millimeters. Another drills students in common metric conversions of millimeters, centimeters, meters, and kilometers. "Metric 21" uses the intrigue of gambling to provide practice in metric estimation skills.

Children must use strategy involving a knowledge of prime numbers to beat the 'taxman' in a game of the same name.

**Metric & Problem Solving** teaches subjects in metric measurement, number lines, and prime numbers while developing a variety of mathematic skills including, logical deduction, estimation of distance, and map reading. It would be valuable in any elementary school curriculum.

## Minus Mission

Atari Inc.

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.0

*Value for Your Money:* 8.0

*Support Availability:* 8.0

*Video Design & Clarity:* 8.5

*Overall Efficiency:* 8.0

*Documentation:* 8.0

*Price:* Quoted by Vendor

Slimey green blobs wear subtraction problems on a dangerous planet in outer space. A brave little robot struggles to carry out an important mission while avoiding this gooey stuff which continually falls from green clouds hanging

over his head. As the blobs fall, children help the robot destroy them by solving the subtraction problems and positioning the robot for a direct hit. Hits and misses displayed in the clouds tally the score on problems

answered during the play.

This challenging learning game provides an amusing setting for

subtraction drill, and is recommended for grades four through seven.

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## Monkey up a Tree

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APX

*System Requirements:* 16K, cassette; 24K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$25

A little hungry monkey has spotted his favorite continental cuisine, a veritable treeful of ripe bananas. But alas, the only way he can reach the fruit is to correctly solve a random series of arithmetic problems. Since you are the math mage in this game, it's clearly up to you to see that the poor little critter gets fed.

Each time an equation appears beneath the tree, you must type in the answer. If you answer correctly, the monkey can climb part way up the tree. If you waste too much time puzzling over the solution — or miss a problem altogether — down he slides.

Your monkey can only grab

one banana per correct response, so you'll have to mind your “+”s and “-”s to satisfy his hunger.

The game can be played by one to two players. Each correct answer increases the level of difficulty. Depending on your speed and accuracy in solving each problem, the program will automatically adjust to heighten the challenge.

As a tutorial device, the program is a simple electronic flash card series with the advantages of computer-monitored progressions. As a learning game, it's an engaging motif with a high level of interactivity.

## Multiplying Binomials

*JMH Software of Minnesota, Inc.*

*System Requirements:* 16K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.5  
*Price:* \$10

This program introduces students to the FOIL method of multiplying binomials. The student is provided with extra help if an error is detected in the multiplication.

The instructor or student can

pre-select the range of the leading coefficient. Exercise drills are reinforced by demonstrative analysis of the correct solution.

The computer monitors the student's performance and generates a summary upon conclusion.

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## Percentages

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*Educational Activities, Inc.*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$45

This package contains three programs, each designed to instruct and reinforce skills needed in solving percent problems. Using tutorial and drill formats, the computer randomly selects the problems the student is to solve, eliminating repetition of problems.

Introduction to Percents conditions the student to convert decimals to percentages. Fractions as a Percent provides explanations and practice in writing fractions

in percentage form. In Finding a Percent of a Number, students apply their newly gained know how to solve for the percentage of a given number.

This program is designed for Junior and Senior High School students. The program seems to be a bit simple for senior students, who should be entering algebra and geometry classes. It would seem well suited for those students who need remedial instruction in basic math skills.

## Number Blast

APX

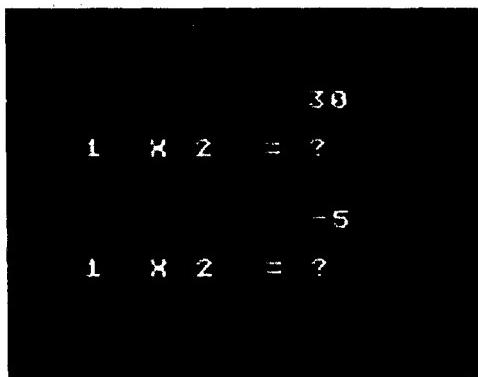
**System Requirements:** 16K, cassette; 24K, disk, joystick  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.5  
**Overall Efficiency:** 8.0  
**Documentation:** 7.5  
**Price:** \$18

Quick reflexes and adept arithmetic are the only way to win this motivational math drill disguised as an alien target shoot. One or two can play. Each player uses a joystick to blast off to the correct answer of elementary multiplication and addition problems.

Incorrect answers cost each player points. Depending on the drill chosen, the player with the highest score — or the first to reach 200 points — wins the game. You can customize the joystick response to slow, medium, or rapid speed.

The addition drill uses random numbers from 1 to 20 with tables involving 1 to 9. Multiplication problems are generated from integers from 1 to 12.



## Secret Formula

Atari Inc.

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 8.0  
**Support Availability:** 9.0

**Video Design & Clarity:** 8.5  
**Overall Efficiency:** 8.5  
**Documentation:** 8.5  
**Price:** Quoted by Vendor

Secret Formula captures the imagination of children with thought-provoking math problem solving. Remember how the idea of a "secret code" caught your interest as a youngster? In this

program students try to unlock randomly generated mathematical secret codes at three different difficulty levels.

How it works all starts with the "Guess Mode". Give the com-

puter a number and it gives one back to you which is the same number after having the "Secret Formula" applied to it. From here you can continue to give the computer numbers, using logic and guessing at patterns to determine the code.

Once you think you have it you move to the "Test Mode". Here you can test your theories and if they prove correct, reveal the "Secret Formula".

At the first level of difficulty, the secret code contains elements

of addition, subtraction, multiplication, and division. The third, most difficult level uses complex exponential and algebraic concepts. Another option in "Secret Formula" gives students an opportunity to devise their own secret codes and try them on classmates.

An engrossing and creative learning game, "Secret Formula" is one of those that evokes thought and learning. It is recommended for fourth through twelfth grades.

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## Success With Math: Addition/Subtraction

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*CBS Software*

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$25 disk  
\$20 cassette

This program is an autotutorial for students who need remediation in basic math skills, but can also be used as a supplement to other sources of instruction.

**Success with Math** supplies the computer with infinite patience as it presents addition and subtraction problems, accepts the student's input, and assesses the response. The student controls the pace of the drill in any of nine possible difficulty levels.

The arithmetic problems are

randomly generated with up to nine digits. Students have two chances to enter a correct answer to each problem; if the second attempt fails, the computer will correct the answer and demonstrate the proper solution.

The **Success with Math** series is made up of exercise drills, not autotutorials. However, the programs offer good self-pacing and exceptional flexibility, making them appropriate for use both in the classroom and at home.

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## Success With Math: Linear Equations

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**CBS Software**

**System Requirements:** 32K, disk or cassette  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.0  
**Overall Efficiency:** 8.5  
**Documentation:** 8.0  
**Price:** \$25

This program provides students in seventh to tenth grades with practice and skill development in linear concepts and problems. The student can proceed at his or her individual speed, choosing the level of difficulty. This program is designed for those students who need remedial help and/or reinforcement of basic math concepts.

The problems are randomly generated in the form "AX + B = C" where A, B, and C are integers. When a student makes an error, the computer corrects the answer and demonstrates the procedure for arriving at the proper solution.

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## Success With Math: Multiplication/Division

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**CBS Software**

**System Requirements:** 16K, disk or cassette  
**Program Depth & Detail:** 7.0  
**Value for Your Money:** 8.0  
**Support Availability:** 8.0

**Video Design & Clarity:** 7.0  
**Overall Efficiency:** 8.0  
**Documentation:** 8.0  
**Price:** \$25 disk  
\$20 cassette

This tutorial for seventh to tenth graders is suitable for remedial instruction or supplemental reinforcement in elementary multiplication and division. The exercises are self-paced and self-developing, progressing at the student's own level of mastery.

The student or instructor can

stipulate drills with one, two, or three digits. Correct answers prompt an animated pat on the back; wrong answers are corrected by the computer to demonstrate the proper solution.

This no-nonsense practice disk offers an efficient learning forum, good interactivity, and variable levels of difficulty.

## Success With Math: Quadratic Equations

CBS Software

*System Requirements:* 32K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$25 disk  
\$20 cassette

This arithmetic drill is suitable for students in eighth through eleventh grades in need of remediation or skill development in the area of quadratic equations. The program consists of a set of randomly generated practice sessions paced by the student and corrected by the computer.

Each problem is solvable by factoring. The computer supplies step by step procedures for arriv-

ing at the solutions. The student uses the monitor as an electronic scratch pad to extend the equation and solve for the variable.

The drill is self-paced; the program will not advance until the student has successfully dealt with the current problem. If an incorrect response is entered, the computer will demonstrate the proper solution.

## Three R Math Home System

APX

*System Requirements:* 40K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 7.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$25

This elementary arithmetic tutorial is based on classroom computer concepts but adapted specifically for use in the home. There's no instructor grading or comparative score keeping, but you'll find a flexible system for tailoring math exercises to individual learning requirements.

Recommended for children ages 5 to 13, **Home System** allows

children to work at their own speed and ability level.

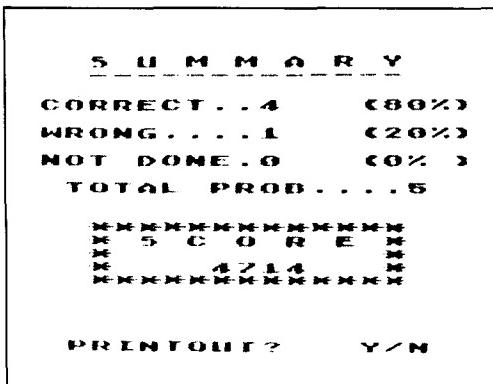
You or your child can choose from 101 levels of addition, subtraction, multiplication and division. The child is given a five letter password, to which the speed, number of equations per lesson, and time limit are programmed.

To operate the program, the

student simply enters his personal password and receives an individualized exercise drill. The computer rewards correct responses with a congratulatory message and monitors on-going performance. The pupil's work can be printed out for parental reference.

A parent's manual is supplied with the software to provide step-by-step instructions for setting passwords, customizing the exer-

cises, and organizing a learning development program.



## Trap-A-Zoids

*Designware*

*System Requirements:* 16K, disk

*Program Depth & Detail:* 7.5

*Value for Your Money:* 8.0

*Support Availability:* 8.0

*Video Design & Clarity:* 7.0

*Overall Efficiency:* 7.5

*Documentation:* 8.5

*Price:* \$40

**Trap-A-Zoids** is an interactive geometry game that closely emulates the popular Bumble series, challenging the early learner to plot shapes on a grid. As in Bumble software, the Master of Ceremonies here is an amiable alien with fast feet. The general object is to trap an unsuspecting Zoid as it scampers across the screen, by successfully enclosing it in a geometric construction.

The program has five levels of difficulty, each calling for varying complexity of design. A beginner

needs only connect the right dots on the grid to form a triangle, rectangle, or square. When you trap a Zoid, the computer racks up your score and produces another alien. You won't get credit for completing a shape if you fail to snare the Zoid in the process.

To draw the shape, the student positions the cursor on any point in the grid and depresses the joystick button (or RETURN), then moves to a second point and does the same. Instantly, the computer plots a line between the

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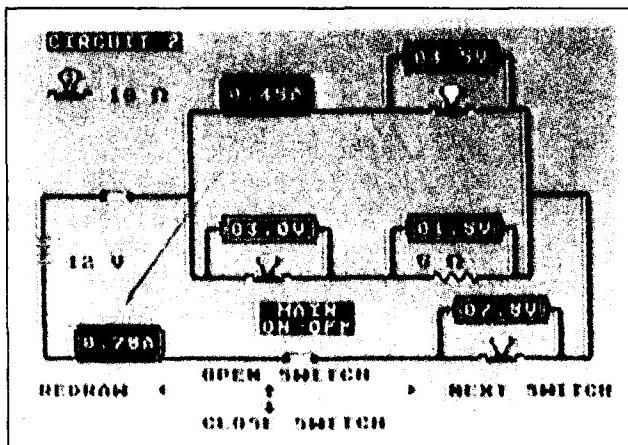
designated points. As you increase the level of difficulty, the geometry increases in sophistication. Not only must you snare the alien, you'll also have to construct a specified shape like an isosceles triangle, trapezoid, or hexagon. The computer may also pose a multiple choice question when a SuperZoid bursts through a trap and heads for stage left. Fail to punch in the correct answer before the alien exits, and

it's the Zoid who collects the points.

Besides content complexity, you can also vary the difficulty of the game, by stipulating the speed at which the Zoid traverses the grid. The game progresses at a sluggish pace, and the graphic quality is only average at best. But overall, **Trap-A-Zoid** is an engaging forum for teaching simple recognition of the names of geometric shapes.

## Science Education

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Circuit Lab — APX

## AtariLab Light Module

*Atari Inc.*

*System Requirements:* 16K, cartridge;  
*AtariLab Interface*  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 8.0  
*Support Availability:* 9.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 9.0  
*Price:* Quoted by Vendor

The second completed module of the **AtariLab Series**, this program guides and processes data in a variety of experiments involving that illusive quantity — light.

As in all the modules, an easy-to-understand student manual suggests a wide range of projects with step-by-step instructions. The "AtariLab Interface" required allows the experimenter to connect various probes and sensors to the computer, automatically collecting, analyzing, and displaying scientific data.

In this module a light sensor and small light powered by the

interface are equipment for many projects. Using these the student is able to observe the process by which different materials absorb light, study the importance of light on bacterial growth, understand how radioactive materials decay, and study different rates of sedimentation.

A disk drive and printer are recommended to store and display data. Designed for use at home or in the classroom, **AtariLab Light Module** is an engrossing and effective learning tool for fourth graders to adult.

## AtariLab Starter Set with Temperature Module

*Atari Inc.*

*System Requirements:* 16K, cartridge  
*Program Depth & Detail:* 9.5  
*Value for Your Money:* 8.5  
*Support Availability:* 9.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 9.5  
*Price:* Quoted by Vendor

The first of the exciting **AtariLab Science Series**, **AtariLab Starter Set with Temperature Module** demonstrates the im-

pressive educational potential of this group of science programs, designed to function as the core of a fourth to twelfth grade

science curriculum. A complete set of equipment and a comprehensive instructional manual give the beginning scientist plenty of material for a wide range of temperature and heat-energy experiments.

This **Starter Set** contains the "Atari Lab Interface", an integral part of all the science modules. It allows the student to connect various probes and sensors to the computer, automatically collecting, analyzing, and displaying scientific data. Three different temperature sensors are included in this package — a temperature sensor, an electronic thermometer, and a standard bulb thermometer.

The easy-to-read experimenter's guide lists and explains a wide range of projects, demonstrating different scientific theory.

Students explore, for example,

concepts of temperature, heat, and energy transfer in different milieu, including an in-depth section on the weather and environmental factors. One experiment looks at the response time of the scientific equipment while another explains the graphing so essential to an understanding of experiment results.

The **AtariLab Series**, as evident in this particular module, attempts to cover much of the requirements of the traditional science lab. Particularly efficient is the immediate feedback students get from experiment data, and the ability of the computer to automatically take timed readings for a period of up to twenty-four hours, every ten seconds. A disk drive and printer are recommended to store and display data collected.

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## Chem Lab Simulations

*High Technology Software*

*System Requirements:* 48K, disk

*Program Depth & Detail:* 7.5

*Value for Your Money:* 8.0

*Support Availability:* 8.0

*Video Design & Clarity:* 8.5

*Overall Efficiency:* 8.0

*Documentation:* 8.0

*Price:* \$100 each

**Chem Lab Simulations** consists of four independent program disks designed for self-instruction in the secondary school chemistry lab.

### Simulations 1: Titrations

Titration simulations provide a forum for vivid demonstrations

of three lab experiments. High-resolution graphics and quasi-animation portray acid-base titration in the first module. The second lesson focuses on the technique for determining a weak acid equilibrium constant, using both titration techniques and pH meter. In the third module, the student encounters Avogadro's number and participates in an illustrative experiment based on both titration and monomolecular simulations.

#### **Simulations 2: Ideal Gas Law**

The second disk in the "Chemlab" series utilizes "normal" graphic displays to depict changes in gas structure. Animated gas particles in collision portray the law  $PV = nRT$ . As pressure, volume, temperature, and number of gas moles are increased or decreased, the student sees the immediate change in the gas molecules depicted on the monitor.

The Kinetic-Molecular Theory and the principles of gas diffusion are also illustrated expanding on the movement of gas molecules.

#### **Simulations 3: Calorimetry**

In the third disk, Hess's Law is

demonstrated using animated high-resolution graphics. The lessons focus on three different chemical reactions and their resultant heat output.

#### **Simulations 4: Thermodynamics**

This program demonstrates heat of vaporization and the thermodynamics of an equilibrium reaction, using an animated capillary tube. The user graphically plots accurate pressure and temperature data derived from the heating of samples. The slope produced is used to determine the liquid in the vaporization experiment. In the thermodynamics experiment the slope of the plotted line is used to calculate the enthalpy, entropy, and the free energy of the equilibrium reaction.

The disks are accompanied by student manuals containing sample calculations and explanations of the demonstrated theories and principles. Each disk in the series is priced separately at \$100; the producers will replace damaged or worn diskettes for a \$10 fee. Enhancements and updates are available for a package price of \$35.

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## Circuit Lab

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APX

*System Requirements:* 32K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$30

This electronics tutorial is designed for classroom use as well as hobby applications in the home.

You can work with series, parallel, or combinations to design circuit layouts. The joystick controls the placement of switches, light bulbs, registers, ammeters, and voltmeters in your on-screen diagram. When you've finished your diagram, test its in-

tegrity by closing the main switch. If you've made a mistake, a light bulb will illuminate.

If your circuit needs redrafting and you're completely stumped, consult the beginner's level student manual that accompanies the program. You'll find a basic discussion of design theory, an overview of physical laws, and sample diagrams to aid you in testing your circuits.

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## Earth Science

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MECC

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 9.0  
*Price:* \$45

Graphic representations have always been the key to understanding in the study of earth sciences. **Earth Sciences** presents fascinating graphic simulations and demonstrates the amazing computational capabilities of the computer in six lessons on astronomy, earthquakes, and minerals.

Three of the lessons use a

simulation of the constellations to explain concepts of distance in space and the rotation of planets and interstellar bodies. "Earthquakes" shows students how to use the computer to calculate seismic waves and the distance to the earthquake epicenter. "Minerals" teaches students how to identify twenty-nine different

minerals, entertaining students with fascinating bits of trivia in the process.

**Earth Science** is designed for classroom or individual use in fifth to ninth grades.

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## Elementary Biology

MECC

*System Requirements:* 16K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 9.0  
*Documentation:* 9.0  
*Price:* \$50

Students really become involved in learning about food chains when they take the part of a fish or a fox in life-like simulations of a lake or a forest. **Elementary Biology** offers elementary to junior high school students uniquely interactive lessons on food chains and circulatory systems, the "Odell Lake" and "Odell Woods" simulations and "Circulation".

"Odell Lake" and "Odell Woods" are a wealth of ecological information presented in such an enjoyable manner that students will spend hours learning what it is like to be a fox, wolf, rabbit, or mouse, in the woods,

or a whitefish or blueback salmon in a lake. Fascinated by the outcome of everyday decisions the curious student might survive a whole day in lake or woods only to be caught at the end by a sneaky fisherman or hungry predator. When students become involved, learning takes place and **Elementary Biology** creates this type of a setting.

Exceptional color graphics simulate the path of a blood cell moving throughout the circulatory system of a fish with a two-chambered heart in a tutorial and drill on circulation.

Use **Elementary Biology** in the classroom or at home.

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## Frogmaster

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*Atari Inc.*

**System Requirements:** 24K, disk; joystick  
**Program Depth & Detail:** 9.0  
**Value for Your Money:** 8.5  
**Support Availability:** 9.0

**Video Design & Clarity:** 8.5  
**Overall Efficiency:** 8.5  
**Documentation:** 8.5  
**Price:** \$20

A unique learning game, **Frogmaster** combines an exciting arcade-game format with a simulation of Skinner's experiments in behavior modification. Science and social studies curriculums will welcome this unusual program where students vicariously experience the results of experimentation in conditioning animals.

The "guinea pigs" are frogs and tadpoles who start the game with primitive brains entirely simulated by the computer. They are positioned on opposite ends of a "football pond" and one to four players compete to be first to train their tadpoles to cross their opponents goal line. The key is in "training". The frogs alone are happy to jump random-

ly around the pond. Only sufficient "reward" (the joystick button pushed when they jump the right direction) will turn their interest toward the goal posts. Rewarding causes the tadpoles to change colors, squeak in delight, and actually modifies their "brain cells".

More difficult levels of play challenge the players by adding walls and metamorphosizing the tadpoles into frogs that lay eggs and eat opposing players.

Amusing graphics and sound, original instructional milieu, and varied levels of difficulty make this program an interesting experience for children nine years old to adult.

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## Morsecode Master

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*APX*

**System Requirements:** 24K, cassette; 32K, disk  
**Program Depth & Detail:** 8.5  
**Value for Your Money:** 8.5  
**Support Availability:** 8.0

**Video Design & Clarity:** 8.5  
**Overall Efficiency:** 8.0  
**Documentation:** 8.5  
**Price:** \$30

If you're trying to get your license as an amateur radio operator, you might find the process of mastering Morse code more time consuming than you bargained for. Memorizing individual characters isn't quite enough: just try interpreting all those dots and dashes as you hear them rattled off on a receiver.

This program provides an interactive tutorial for Morse code, with both audio and visual reinforcement. The result is a practical, hands-on conditioning tool with freeform flexibility.

You start by entering the character you want to learn — a letter, number, or punctuation mark. The computer responds by

sounding the code for your specified character three times. When you want to practice, you can try to decipher characters chosen randomly by the computer.

When you're ready to progress to complete words, the computer will rattle off codes from its 400-word dictionary. You type in the answer; if you need help, the computer will help you decipher. As your proficiency increases, you can move up to sentences. You can control the speed and pitch of the drills to correspond to your own level of interpretation.

The accompanying user's manual includes a chart of signals.

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## Parts of the Microscope

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### Educational Activities

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 7.5  
*Documentation:* 7.5  
*Price:* \$20

This program is designed to teach students the parts and functions of a basic microscope. The computer highlights each part graphically, and elaborates on its corresponding function and purpose.

Each frame concludes with an abbreviated quiz. If a student enters an incorrect response, the program will branch to a subrou-

tine offering a simplified tutorial on the same topic. An animated display "rewards" successful performance.

This lesson disk has a sound educational design, but is perhaps a little overblown for the "scope" of its subject matter. There's no substitute for hands-on experience with an actual microscope. This program is

recommended for students in need of extra instruction in this area and for classes that have a

limited number of scopes to go around.

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## Science One: The Human Body

*Brain Bank*

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.0

*Value for Your Money:* 8.5

*Support Availability:* 8.0

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 8.0

*Documentation:* 8.5

*Price:* \$90

This animated tutorial features interactive lessons on each of the body's six major systems. Imaginative graphics are interspersed with question-answer lessons to demonstrate arms flexing, food being digested, and hearts beating.

Each system contains a research and activity section with questions and projects. **The Human Body** series is recommended for children ten years or older, but is best suited for students in seventh to ninth grade.

The tutorials are designed with multiple choice questions which present new information in an interactive format. The authors do not necessarily assume that the learner has been exposed to the subject matter prior to encountering the question. For example, the computer might ask: "Which portion of a bone grows at the fastest rate?" Four possible answers will be any of the

choices, but the program will not advance until the correct one has been selected. Naturally, through trial and error, any pupil will eventually arrive at the entry the computer wants. When the correct response is given, the computer reinforces the topic with a brief discussion, usually a visual demonstration utilizing animated graphics. In our example above, the computer displays a closeup cross section of the bone while a flashing arrow points to the appropriate portion — in this case, the end.

The animation isn't always applied in its best capacity, but the illustrations are lucid and demonstrative. Overall, the series is slick and specific, though lacking sufficient detail for stand-alone use as a self-contained lesson set. These tutorials are strictly introductory, bordering on "body trivia."

As with other Brain Bank productions, the program is

characterized by splendid graphic quality and creative use of sound. The lesson architecture aims in

the right direction, though the content is more abbreviated than most instructors would prefer.

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## Simulated Computer

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*Edusoft*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 9.5  
*Overall Efficiency:* 9.0  
*Documentation:* 9.0  
*Price:* Quoted by Vendor

A clear, comprehensive explanation of microprogramming, **Simulated Computer** teaches assembly language, explains machine language, and simulates in detail the input, output, and central processing units of the Atari computer. An integral part of the learning process is a 33-page instruction manual which carefully leads the student through beginning assembly language instructions, while requiring the student to enter programs and observe the results, eventually gaining enough knowledge to experiment independently with programs on the simulated computer.

Ingenious graphic interpretation of the internal workings of the computer allow students to "see" micro-instruction circuit paths on the screen throughout as they follow the manual at their own speed. The upper one-third of the screen displays the input commands on the left (typed on

an imaginary screen with amusing graphic "hands"), in the center the central processing unit, including fetch, program increment, and execute sections, and on the right the output unit records the output of any program operation. The lower two-thirds of the screen are divided into 24 memory locations.

Simple assembly language instructions appear on the input screen, and corresponding values are filled in designated memory locations. The "run" mode puts the simulated computer to work, as a pointer follows instructions to different locations according to the timing of the program counter. The simulation is paced slowly to allow for concentrated evaluation.

Following the manual, the student is introduced to more sophisticated instructions in an interactive learning situation.

The manual and disk cover a broad range of assembly language

instructions, machine language demonstrations, and programming formats. A list of "challenge" programs with sam-

ple solutions encourage students to reinforce their knowledge through practical application.

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So it's been so long since you've seen the stars through the dense haze of the city that you've probably forgotten what they look like. Yes, they're still there. And this program will show you what they'd look like if you could still see them.

Contained in this program are 900 star coordinates that locate all the constellations of both the Northern and Southern hemispheres. You can display on your home television those stars able to be seen from your location, or any other location you choose. These can be seen at any time and date in the 19th century, down to the very second you specify. The planets of our solar system are illustrated with their respect to the stars. This program takes less than five minutes to produce a complete and accurate map.

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$25

The program prompts you for the necessary information, including longitude, latitude, and time zone. You can view the map in two ways, one with just the stars and the second with the stars and the constellations outlined for you. But don't think this tutorial will let you off without a quiz: you'll find both review tests for both beginners and experts, exercising your diverse recognition of sixty-six constellations.

If you own a telescope, this program will calculate Local Sidereal Time for you, giving you an accurate indication for setting the hour cycle on your scope. In addition, a special "Finder" option will help you specify the Right Ascension and Declination of the center of the map and the area of the field of view.

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## Starware

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APX

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**196**

*Atari Education*

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## **Music Education**

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## Advanced Musicsystem

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APX

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	9.0	<i>Overall Efficiency:</i>	9.0
<i>Value for Your Money:</i>	9.5	<i>Documentation:</i>	8.5
<i>Support Availability:</i>	8.0	<i>Price:</i>	\$30

This versatile composition tool both generates and replays tunes. The user simply enters the sequence of notes to be played by Atari's four voices and specifies the volume desired. The program displays the octave, volume and duration of the last note entered. These values will stay constant throughout the entire piece, or until you enter new settings. The computer will identify the number of beats per current measure that are too long or too short.

You have five and one-half octaves for your composition. A convenient "Copy" feature permits you to duplicate the last entered note or to replicate an entire measure, for that matter. You can also indicate which notes you want to be emphasized. Specify tripled notes if you like — something few music composi-

tion programs can handle.

The playback mode allows you to "perform" any group of measures in combination with Atari's four voices. During the rendition, the computer will display a classic piano keyboard on the monitor screen to demonstrate the sequence of notes. Each of the four voices appears in an assigned color represented on the keyboard when an associated note is generated.

A game paddle can be used to vary the tempo of the current composition.

Five classical tunes are supplied with software — a good indication of the program's detail and scope. The authors do assume that the user has some basic knowledge of musical notation and theory.

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## AtariMusic I

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Atari Inc.

<i>System Requirements:</i>	24K, disk; joystick	<i>Video Design &amp; Clarity:</i>	9.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	Quoted by Vendor

The extremely versatile audio-visual capabilities of the computer become an excellent milieu for the instruction of beginner level music theory in **AtariMusic I**. What's more, this program does away with the periphery of equipment traditionally required to teach this subject.

The software contains both a tutorial section and a reinforcement module in game format. Divided into two subject areas, the tutorial teaches "Note Reading" and "Whole and Half Steps". As the monitor screen displays the treble and bass clef staves, the music student learns the position of all the notes, including flats and sharps, in "Note Reading". The student experiments by manipulating the joystick to position different notes on the staves and simulta-

neously hearing their tone.

"Whole and Half Steps" teaches just that. For practice, the computer plays two-note increments for students and they test their ear, determining whether they heard a whole or half tone change.

Three space games, "Atari-Music I", "Note Attack", and "Stepwise Transporter" exercise the student's newfound know-how.

It is worth noting that **Atari-Music I** heeds several important factors in effective learning, including a highly user-interactive format, clear and concise goal-oriented instruction, and plenty of practice and reinforcement. Recommended for ages three to adult, younger children would benefit from some adult supervision.

## AtariMusic II

*Atari Inc.*

*System Requirements:* 24K, disk; joystick  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

In the sequel to **AtariMusic I**, students of music theory learn about major scales and key signatures in **AtariMusic II**. Recommended for ages three to adult, older students can use this

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

tutorial with little or no adult supervision.

Students use a menu to choose the area of work, starting with the first tutorial, "Major Scales". The lesson stresses techniques for

determining the number of sharps or flats in a given key. The monitor screen displays the treble and bass staves and students hear notes simultaneously as they see them on the screen.

"Hearing Scalewise Melodies" begins ear training of melodies in major keys. Students practice naming notes in a melody by their letter, scale increment

number, or "do, re, mi" designation.

A standard set of space and music games provide motivational exercise and interactive reinforcement of the program lessons. Employing the unique sound and graphic capabilities of the computer, this program efficiently presents music lessons in a sound educational framework.

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## Introducing - Peter and the Wolf

Atari Inc.

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

This computer version of **Introducing - Peter and the Wolf** attempts to introduce children to the idea of musical themes, following the lead of the excellent children's orchestral version by the same name. Not intended to replace the orchestral version, this program uses colorful animation, graphic fonts, and musical sound to present ideas and could be used in conjunction with the orchestra for an integrated audio-visual approach.

**Introducing - Peter and the Wolf** is presented in a format of animated displays accompanied by musical themes with words

describing the themes and storyline written on the bottom of the screen. The script is modified to accommodate a primary grade reading level. Children are taught to associate a theme with a letter, for example "Peter's theme" can be accessed by typing a "P". Students can also test their knowledge in a theme identification game that is joystick controlled.

The program provides an excellent teacher's manual with several creative lesson ideas and is recommended for kindergarten through fourth grade.

## Jukebox One

APX

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$18

This program contains eight classical renditions. Each can be selected from an option menu and is graphically displayed on a five and one half octave keyboard. Notes are displayed in four colors, each responding to Atari's four voices.

You can select from a pleasant repertoire of long-hair favorites:

- Overture to the Nutcracker by Tchaikovsky
- Flight of the Bumblebee by Rimski-Korsakov
- String Quartet in E Flat by Mozart
- Brandenburg Concerto Number Five in the key of D

- Well Tempered Clavier, Air on a G- String, and Fugue in C Minor, all by J. S. Bach
- Fur Elise by Beethoven.

Each rendition can be played separately or by chosen sequence in "Jukebox mode," at any specified tempo.

This program has reasonably good production values — depending on how you feel about Rimski-Korsakov rendered on a dinkity-dink synthesizer. Mercifully, none of the selections can be tampered with, modified, or otherwise violated in any way.

## Keyboard Organ

APX

*System Requirements:* 24K, cassette and disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$25

Listen to your Atari become an organ, amazing your friends with stunning melodies complete with vibrato and attack features. Excellent sound capabilities make

this possible with **Keyboard Organ**, the computer program that turns your keyboard into an organ keyboard.

As you play notes individually

on the computer, they are played with the special sound effects of an organ through the speakers. You have the option of either hearing your tune immediately or recording it to play back and en-

joy as a duet or a round — playing along with it the second time.

Introduce the computer “organ” to children age six and older.

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## Musical Pilot

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APX

*System Requirements:* 32K, disk; 16K, cassette;  
joystick

*Program Depth & Detail:* 8.5

*Value for Your Money:* 9.0

*Support Availability:* 9.0

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 8.5

*Documentation:* 8.5

*Price:* \$25 cassette  
and disk

Delightful animation, colorful graphics, and musical notes teach youngsters beginning concepts in reading music and recognizing distinctions in pitch. Children as young as three will enjoy piloting a plane with joystick around colorful balloons to the tune of musical notes.

The scene is predominately a blue sky striped with a staff containing colored balloons as notes. At the bottom of the screen green grass records the current score on the left and the level of play on the right. There are four levels of

play. The game requires the child to fly his plane towards balloons scrolling from the right at different levels, each representing a note which the child sees correctly positioned on the staff and simultaneously hears.

To avoid collision, the child uses the joystick to fly above or below the balloons. There are four levels of play, each one making it a little more difficult to avoid the bulbous obstacles bouncing by at a faster tempo.

A score of 1000 wins the game and earns the title of Ace.

## Music Series I, II, & III

MECC

<i>System Requirements:</i>	16K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.5
<i>Value for Your Money:</i>	8.5	<i>Documentation:</i>	9.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	Quoted by Vendor

Designed to function as a drill and test aid for music theory classes, this music series handles a formerly tedious workload with ease. The unique sound and graphic capabilities of the computer provide an excellent milieu for the study of music and the learning format a support for independent practice.

Each series is multi-leveled, beginning with a tutorial section and following with exercises at varying skill levels. The menu allows easy access to specific areas and the teachers' guides give background criteria for each exercise, insuring work ap-

propriate to the individual ability.

"Music I" instructs students on terms and notations and tests them on note types, note names, key signatures, musical terms, and enharmonics. "Music II" begins with a tutorial on rhythm and pitch and reviews counting, aural and visual intervals, wrong and missing notes, and rhythm and rhythm play. "Music III" teaches scales and chords and tests whole and half steps, triads, scales, and sevenths.

Use **Music Series I, II, & III** in junior high and high school music theory classes.

## Name Rondo

Atari Inc.

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.5
<i>Value for Your Money:</i>	8.5	<i>Documentation:</i>	8.5
<i>Support Availability:</i>	8.0	<i>Price:</i>	Quoted by Vendor

Children create their own musical compositions in this highly interactive, imaginative program teaching traditional musical form. Taking full advan-

tage of the special sound and graphic effects of the computer, **Name Rondo** demonstrates thirteen different forms of composition, culminating in an engaging

game format applying the newly acquired knowhow.

The program first introduces the learner to the rondo, a repeating musical refrain, and then thirteen musical effects, including trills, glissandos, arpeggios, blocks, chords, and random tones. Using the children's own names, musical alphabet letters

are reserved for the rondo while other letters in the name become different musical forms chosen by the children. Most children find this an exciting experience and the resulting composition becomes a basis for discussion, learning, and further experimentation.

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## Piano Tuner

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APX

*System Requirements:* 16K, cassette; 24K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 7.5  
*Price:* \$30

The piano owner's most dreaded moment is the instant the professional tuner delivers his bill. If you have a good ear, patience and the right tools you can learn to tune your piano yourself.

The "tuning procedures" section of this program will gently guide you through the steps required for a general tuning. The computer provides you with instructions and illustrations for each procedure, then supplies the tone you need to adjust your piano.

"Single tones" will give you the option of 88 possible pitches. You use the joystick to select the note you want. Depressing the

button on the controller will produce the tone.

If your ear isn't as good as you would like and you need a little help, you can choose "ear training". You select a pitch and the program produces two short tones closely spaced together. You can increase or decrease the pitch of the second note by manipulating the joystick. The idea is to match the second tone to the first.

This well conceived program deserves meritorious recognition for its original application of the Atari's outstanding aural qualities to a valuable and highly pragmatic objective.

## Phone Home

APX

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 9.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* Quoted by Vendor

A simple and amusing music program for youngsters, **Phone Home** uses colorful graphics, animation, and charming sound to teach children rudimentary concepts of music and their own telephone numbers. Most kindergarteners through third graders will find the musical requirements of this program particularly well suited to their novice abilities.

This simple game immediately attracts interest by using the logo of the popular science fiction movie E.T. Children type in their initials and phone numbers before listening to a little melody. Then

**Phone Home** teaches them to recognize the notes C and G. The developers of this program feel that learning to distinguish between C and G is a valuable exercise for children. Building a sound foundation in the concept of pitch and a developing ear for these two notes will make it easier for children to learn the more subtle differences between all the notes later on in a more comprehensive music program.

**Phone Home** is an enjoyable introduction to the computer and music theory appropriate for home or classroom use.

## Player Piano

APX

*System Requirements:* 24K, cassette; 40K, disk  
*Program Depth & Detail:* 6.5  
*Value for Your Money:* 7.5  
*Support Availability:* 8.0

*Video Design & Clarity:* 7.0  
*Overall Efficiency:* 7.5  
*Documentation:* 8.0  
*Price:* \$25

As its title denotes, this musical supplement provides a limited simulation of a not-so-refined player piano. It's both a tutorial and a practice tool, with an on-

screen depiction of an abbreviated piano keyboard.

The notes corresponding to the white keys are listed above each key. The black keys, however, are

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unlabeled. The program has two modes: in "Piano mode," a tone is produced each time you strike a key. The tone is continuous until you depress another. The effect is one of actually "playing" the computer, but alas, you can generate only a single tone at a time. The computer simply refuses to acknowledge a chord.

In an alternative mode, your music can be saved for replay at a future time. To create a composition, you enter each note one at a time, and "program" its duration. If you wish to change the tempo of a tune you must re-enter every note.

Unfortunately, the program will not let you delete a note or insert a new one in the middle of a composition. You can edit a song to modify its effect, but the process is more arduous than starting again from scratch. Worse, you can only change one note at a time. There is no command to clear memory to start a new composition.

The software is supplied with two sample compositions: Happy Birthday and Take Me Out to the Ball Game. As I'm sure you're quick to visualize, the titles alone are enough to characterize the program.

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## **Curriculum Resources**

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## ATARI PLATO

*Control Data Corporation*

*System Requirements:* 48K, cartridge; modem;  
joystick  
*Program Depth & Detail:* 9.5  
*Value for Your Money:* 8.5  
*Support Availability:* 9.5

*Video Design & Clarity:* 9.5  
*Overall Efficiency:* 9.0  
*Documentation:* 9.5  
*Price:* Subscription

A subscription and modem will connect you to six thousand programs comprising an amazing educational library on almost any subject imaginable. A remarkable time-sharing network originally developed as a research project by the department of Coordinated Science Laboratories at the University of Illinois, "PLATO" embodies our most creative and constructive fantasies about the future of computers in education.

With **ATARI PLATO** a simple cartridge allows the computer access to the time-share network. A modem connects your telephone to the PLATO library with its wealth of information and in a moment can give you your choice of a software catalog containing a myriad of subjects, for example, — elementary reading, biology, amino acids, amoebas, thermodynamics, vocational guidance, women's employment, advertising, banking, childbirth.... The catalog is extensive and comprises a complete repertoire of educational subject matter at any grade level.

Serious investment of time,

knowledge, energy, and money has gone into the development of PLATO software. The educational quality offers a sound learning format and graphic displays of exceptional design. Additional features include touch screen capabilities, "zoom" lens, and imaginative fonts. Use your Atari joystick to "touch" or "point" to different parts of an illustration (perhaps the patella in an anatomy drill). "Zoom" in for a close-up in high resolution graphics. For the kids, type fonts and displays are continually a surprise, keeping their attention and interest.

**ATARI PLATO** pays attention to the special needs of students and educators. "Complex Response" is a performance evaluation section which records, collects, and analyzes a student's answers and uses this information to individualize interaction, guidance and hints.

A subscription to the PLATO time-share system connects you and your school to students in other schools around the world who have a PLATO system.

## MicroTeach

CompuMax

<i>System Requirements:</i>	48K, 2 disks; Atari BASIC	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Overall Efficiency:</i>	8.0
<i>Value for Your Money:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Price:</i>	Quoted by Vendor

This elegant authoring system permits custom design of computer-administered instruction and testing without a background in computer programming. However, the program's value depends ultimately on the user's familiarity and proficiency in autotutorial technology. In the hands of an inexperienced instructor, **MicroTeach** is little more than an electronic workbook; guided by a skilled lesson designer, the program has the potential to be the most valuable piece of software in the classroom.

An on-screen menu provides a quick reference guide to the command format and program options. An integral screen editor permits the creation of custom displays for imparting new information and describing examples. A single "page" of instructional text can be longer than the vertical dimensions of the monitor; the screen will scroll vertically to accommodate virtually any display length.

The fundamental component in programmed instruction is the

"response frame" which requires a specific action by the learner before the program will advance. **MicroTeach** offers the option of multiple choice questions, "True/False" or "Yes/No" evaluations, and associations problems. Open-ended responses are also permissible, but owing to the relatively large margin of error, not recommended.

When a student logs onto a user-designed lesson, he must enter his initials and password. The computer will track the pupil's progress and store the results for future interpretation. Used as an automated testing tool, **MicroTeach** offers the advantage of intrinsic scoring and grading.

With unlimited application in curriculum development and uncommon flexibility in lesson design, this product is an indispensable tool for any Atari classroom or computer lab. Its use requires meticulous planning, attentive research, and pronounced insight into the underlying processes that constitute learning behavior.

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## Practice Makes Perfect

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MECC

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* \$43

This package contains three programs for creating custom computer lessons and automated tests.

“Question Maker” permits creation, editing, and storage of questions and answers for tests on any subject and at any grade level. The program offers three formats for your problems — True/False, Multiple Choice, or Short Essay.

The “Test Generator” module

is a print formatter that reproduces your exercise on hard copy.

A separate “Review” module administers drills based on the exercises created with the Question Maker option. Each student’s performance will be monitored and scored for future evaluation.

The package is accompanied by a detailed user’s manual that includes sample tests of various formats for use in designing your own materials.



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## **Entertainment**

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*“The imaginative man, if his life  
is to be tolerable to him, must have  
leisure to tell himself stories, and a  
position which lends itself to imagi-  
native decoration . . . ”*

*George Bernard Shaw*



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## About Computer Games

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If you're like most microcomputer owners, you use your machine at least 30% of the time for entertainment. There are few more worthy opponents than your computer, whether your taste is chess, galactic dogfighting, or medieval sleuthing.

Atari games generally fall into three broad categories: video action games that challenge your reflexes, strategy games that test exercise your concentration, and adventure fantasies that stimulate your imagination.

### **Video Action**

When was the last time you lit up the barbecue in the back yard when the sky suddenly darkened with a horde of alien hamburger patties from outer space? Or prowled through fifteen levels of a heavily guarded high rise to steal KGB secrets? From alien target shoots to vicarious frog leaps, video action games cater every age and sophistication.

We classify any game into this category if the primary action takes place on the screen and if the player's reflexes are crucial to the outcome. In most instances, the player goes one on one against the computer, but some permit two or more enthusiasts to compete.

## Strategy

This broad classification encompasses most any game where composite tactics determine the outcome. Most are not "real time"; the player can ponder his move at his leisure before the game proceeds. Hence, "Computer Football" — in which opposing coaches match wits to call offensive and defensive plays — is considered a strategy game, but "One on One with Larry Bird and Dr. J" — in which all the action is controlled by joysticks — is classified as an action game.

The category includes board games, like chess and Monopoly, as well as combat simulations. We've also classified card games and puzzles in the "strategy" group.

## Adventure Fantasy

A unique breed of all-prose fantasy games holds a large and loyal following. These "dungeons and dragons" scenarios all have several traits in common. They all use text narratives to describe a story line in which the player is the principal character. They also contain numerous junctures at which the player must enter a decision or action. Some provide menus of possible actions — "leave the room, pick up the sword, scream for help," etc. Others require that the player enter decisions in the form of

complete words or sentences based on pre-defined syntaxes. Depending on the program's vocabulary, the player can almost carry on a complete conversation with the computer.

The development of the plot depends on the action or decision. The computer will branch to a new scenario based on each entry. For instance, let's say your alter ego spots a severed hand lying in a dungeon. You might enter "Look at hand," and the computer would proceed to describe the gory details. Or, you might say "Leave through the North Exit," and you may be sorry.

Variations on the theme include detective mysteries with musty mansions in lieu of medieval castles and sci-fi fantasies with hideous aliens playing the role of dragons.

The best precaution to observe with entertainment software is to actually **see** the program run before you buy it. Some of the most lavishly packaged games with striking illustrations on the label are disappointingly amateurish on the screen.

Consider the program's flexibility in relation to your ongoing amusement. Once you master the game, will you continue to be entertained? The best games have varying levels of challenge and randomly generated scenarios to keep you perplexed and preoccupied indefinitely.

# Entertainment Software Checklist

## I. Action Game

- Level of challenge:  Extremely challenging  
 Moderately challenging  
 Fairly challenging  
 Not challenging
- Interest lifetime:  Will keep my interest for years  
 Will intrigue me for months  
 Will interest me for a few weeks  
 Will soon begin to bore me
- Graphics:  Excellent  Good  Fair  Poor
- Animation:  Excellent  Good  Fair  Poor
- Resolution:  Hi-Res  Normal  Poor
- Design Quality:  Highly artistic  Professional enough  
 Average quality  Amateurishly clumsy
- Speed:  Very fast  Fast  Average  Slow
- Complexity:  Very complex  Complex  Average
- Levels of Difficulty:  5 or More  2 to 5  1
- Changeability:  Conditions change every time  
 Conditions can be changed as desired  
 A few conditions can sometimes be changed  
 No possible changes in playing conditions
- Action controlled by:  Keyboard  Joystick  Paddle
- Players:  Several can play  Two can play  
 Only one can play
- Scoring:  All scores compared  Best score saved  
 No scoring
- Retention:  Game can be saved in progress  
 Game can be saved at certain intervals  
 Game cannot be saved

## II. Strategy

Level of challenge:  Extremely challenging  
 Moderately challenging  
 Fairly challenging  
 Not challenging

Category:  Card game  
 Board game  
 Combat game  
 Sports game  
 Other: \_\_\_\_\_

Levels of difficulty:  Several levels  
 A few adjustable levels  
 Not adjustable

Simulation:  Highly realistic  
 Moderately realistic  
 Fairly realistic  
 Not realistic

### **III. Adventure Fantasy**

Plot:      Highly developed and complex  
          Several alternative developments  
          A few possible outcomes

Theme:  Simple and predictable  
 Dungeons and dragons  
 Science fiction  
 Detective mystery  
 Contemporary

Characters:  Diverse assortment  
 A decent variety  
 A few different characters  
 Hardly any

Vocabulary:

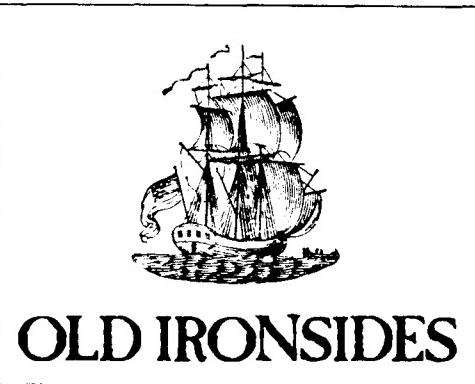
- Extensive range
- Several possible statements
- A few words or abbreviations
- Limited vocabulary
- Actions determined from a menu — no statements are entered

- Depth and detail:  Highly detailed  
 Moderately detailed  
 Fairly detailed  
 Hardly detailed
- Graphics:  Excellent  Good  Fair  Poor  None
- Animation:  Excellent  Good  Fair  Poor  None
- Plot aids:  Map  
 Character descriptions/depictions  
 Vocabulary list  
 Sample entries  
 Hints/clues
- Series:  Part of an ongoing epic  
 A singular piece
- Retention:  Game can be saved at any point  
 Game can be saved at specific intervals  
 Game cannot be saved
- Scoring:  Successes result in points or added power  
 Points awarded for goals and gains  
 No scoring

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## **Video Action Games**

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Old Ironsides — Xerox Education Programs

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## Alley Cat

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Synapse

**System Requirements:** 16K, cassette; 32K, disk  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.0  
**Originality:** 8.5

**Video Design & Clarity:** 8.0  
**Documentation:** 7.5  
**Difficulty:** 8.0  
**Price:** \$35

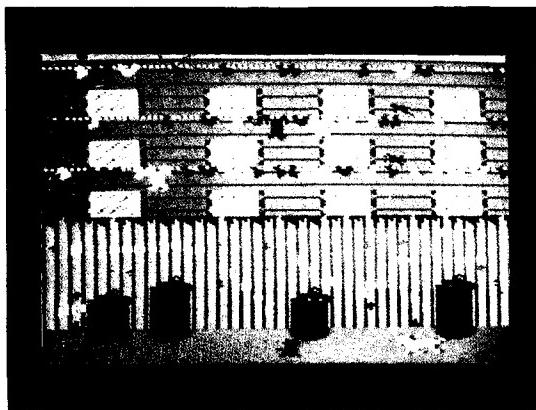
This game (or course) is set in an alley full of trash cans, a fence, and several clothes lines. Your average run of the mill city alley — what cat could ask for more?

Your job is to help the neighborhood Humane Society dropout bag mice. The task isn't easy. The poor kitty has to jump from the alley to trash cans to the fence, then ever so carefully cross from clothes line to clothes line.

The black cat must hold on by his claws to the hanging wash to get his mice. Of course, these rotten little rodents are keen on escape; invariably, they'll loosen the clothespins to release the clothes, sending our fervent feline to an untimely demise. As if the

mice weren't enough your cat has to deal with the local dog patrol.

An amusing sound treatment includes dogs barking and cats meowing. You'll also hear the noise of the cat landing on a metal trash can and the growling and hissing of rumbling kitties.




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## Anti-Sub Patrol

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Roklan Corp.

**System Requirements:** 32K, disk or cassette  
**Program Depth & Detail:** 7.5  
**Support Availability:** 8.0  
**Originality:** 8.0

**Video Design & Clarity:** 8.0  
**Documentation:** 8.0  
**Difficulty:** 7.5  
**Price:** \$30 disk  
\$20 cassette

This make-believe sub chase poses you as the captain of a destroyer on the prowl for enemy submarines. Your sonar display will tip off enemy positions. Only your reflexes and tactical skill will maneuver the ship safely out of the range of missiles and mines.

When you do locate the enemy, you'll have to accurately compute the exact position that will place you directly over the sub, then calculate the proper depth for your charges.

You have the option of either moving your destroyer or scanning the sonar. With mines everywhere, moving blind is a

fast way to destroy your own ship. Even as you scan, the enemy is honing in on your sonar and preparing a torpedo surprise.

In all likelihood, you'll end up losing all three of your ships before you manage to get even close to a single enemy sub.

The graphics in this program are...well, crude. Your position is indicated with a red ellipse, and a sighted sub is represented by “+”. The remaining data is all-prose. Still, it's a demanding challenge that calls for attention to detail and keen tactical strategy.

## Apple Panic

*Broderbund*

*System Requirements:* 48K, disk; 16K, cassette  
*Program Depth & Detail:* 7.0  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 7.5  
*Documentation:* 7.0  
*Difficulty:* 8.0  
*Price:* \$30

Trapped in an old brick mansion, you're attacked by thousands of apples. Your only hope of survival is to grab a shovel and start digging holes in the floor. Once you have an apple in a hole, start pounding on it with the shovel until it falls through to the next level. Try another one, but don't turn your back: the apple is crawling out — and it has a voracious appetite for computer users.

Each level of the house is connected by ladders. The operator uses the I, J, K, and M keys to control movement. The A and S keys are used to dig and fill the holes. The player has three lives; but if somehow you survive the apples, you merely earn the right to take on an even more perilous predator, the dreaded Green Butterfly.

The only way to destroy this formidable foe is to dig a hole

directly above it, mashing the winged wretch through both levels. Ah, but that's not all. Next is the Mask of Death, who

must be mashed through several levels. Survive the match with the Mask of Death and you'll be awarded a new life.

## Arcade Machine

*Broderbund*

*System Requirements:* 48K, disk

*Video Design & Clarity:* 9.0

*Program Depth & Detail:* 8.5

*Documentation:* 8.0

*Support Availability:* 8.0

*Difficulty:* 8.0

*Originality:* 8.0

*Price:* \$60

Raskolnikov stands at the door with an ax in his hand. Inside the flat, the Dapper Duck huddles in a corner hiding his bill in a sleeve of his tuxedo. Outside, the clatter of approaching wine bottles permeates the senses. In an instant, Dapper leaps to his feet, eludes the ax-wielding raggamuffin, and dashes out into the street, aiming his laser straw at the sky. For, the invasion of the alien Cabernet Sauvignons has begun!

A Dostoevskian arcade game, or a California vintner's dream theme after an overdose of mousse and anchovie pizza? Neither. It's just some nonsensical experiment whipped up with **Arcade Machine**, a "universal" action game with definable graphics and sound. This product is an inventive twist on the redundant video action game. After all, at least eighty percent of arcade-style software can be reduced to one or

two basic plots. With **Arcade Machine**, you define the dramatis personae and supply the graphic content. You can even select from a repertoire of pre-programmed clacks, bangs, and zaps.

Five ready-made examples can be modified for your own devious purposes. The graphic quality is not exceptional, so your amusement will be largely a function of your active imagination. If you're a skilled artist or draftsperson, you'll derive more presentable results. However, the younger set (for whom this product is ostensibly marketed) will delight in their own interactive creations. The results are even more striking and suggestive than the innocent beauty of a child's crayon sketch. Consider the case of a six year old boy who orchestrated an orgy of destruction, replete with movie monsters, ghosts, giant spiders, Nazi fighter planes, and nuclear warheads; the object of his game

was to obliterate everything on the screen, including a house, tree, lawn, and the sun. In contrast, one five year old girl wove a touching scenario of tenderness, light, and joy. In *her* game, the idea was to aim sunbeams down on members of a family to make each stick figure warm and happy

(Where she lives it almost never stops raining.).

Want to see what **your** kids think about life in the modern world? Or just want to project your own imagination into interactive video? **Arcade Machine** is an entertaining product with a long lifetime.

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## Ardy the Aardvark

*DataMost*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.5

*Video Design & Clarity:* 10  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

This nicely animated variation on the popular "Eat-or-Get-Eaten" arcade theme gives you a super-tongued aardvark as an alter ego and yummy ant larvae as your diet. Of course, the ants aren't too crazy about you wanting to wolf down their future progeny. They're aided in their antagonism by a host of species from the phyla arachnida and insecta.

The game is played in a maze (of course) which appears on the monitor as a subterranean cross section of the ground beneath your handsome aardvark profile. Through this ant-infested

labyrinth, your serpentine tongue (which apparently has a reach a hundred times or so longer than your body) can slither with ease. It's tip spells instant oblivion to your lepidopteran foes.

In the night sky above you, a half moon glides from west to east, heralding the advent of a new nemesis, the black Widow. Your only defense is to lick a power crystal hidden in a remote corner of the ant maze. (Well, I warned you the game had a familiar ring.)

The program has nine levels of challenge with mazes of varying complexity.

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## Atlantis

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*Imagic*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	7.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$38

Descending in a great, ugly horde, the sinister Gorgons plan to make short work of the poor, old lost city of Atlantis. The civilization's last defense? It shouldn't take you too long to figure it out: you command the three remaining defense posts guarding the skies from alien attack (a primary concern of all ancient island metropolises).

Your mission is simple: destroy every invading Gorgon, or every inhabitant of the city will perish. Unfortunately, the solution is not nearly so succinct.

You see, the better you are at surviving, the faster the Gorgons attack. The more adept your own defenses, the more elusive the insidious invaders. You have the option of destroying them one by

one with mind boggling speed or blasting an entire squadron with a well placed Bandit Bomber.

The longer you hold out the faster the terrible Gorgons attack. You can destroy them one at a time or blast a whole group of them with a Bandit Bomber. If the Gorgons manage to hit and destroy all seven of Atlantis', the city is doomed.

At the end of each Gorgon attack wave you receive points for the portions of Atlantis left intact. If you score enough points the damaged sectors of Atlantis will be replaced.

This action game is designed for one to two players and can be manipulated by keyboard or joystick. Players have two skill levels from which to choose.

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## Aztec Challenge

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*Cosmi*

<i>System Requirements:</i>	16K, joystick	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.5	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$18

This game might be considered the "Aztec Olympiad," posing the players as ancient warriors earmarked for sacrifice with their only hope of survival hanging on victory in a marathon obstacle course.

The course contains seven different screens in ascending order of difficulty. The first three are mere warmups for the multiplicity of leaping, climbing, and jumping feats that lie ahead.

Roaring rivers, massive walls, and perilous stakes must be deftly

negotiated under your watchful joystick coordination. The computer equips you with an initial supply of three "lives" to successfully maneuver through all seven scenarios. However, should you use up your allotment, you can opt to continue the game anyway, but sacrificing all your accumulated points.

The diversity of displays and the acuteness of the challenge give this game above average marks in lifetime of interest among the younger set.

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## B-1 Nuclear Bomber

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*Avalon Hill*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 7.0  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 7.0  
*Documentation:* 8.5  
*Difficulty:* 9.0  
*Price:* \$20

Ninety miles into Soviet territory, a squadron of Russian MIGs appears on the scope.

If this scenario fulfills your lifelong fantasy, **B-1 Nuclear Bomber** might give you the vicarious gratification of being the first nuclear pilot to obliterate Moscow. On the other hand, you might be erased from existence before you ever get there. Even if you'd never dream of flying through the disciplined Soviet defense lines against a fusilade of surface-to-air missiles, this is a captivating role game.

In this quasi-simulation, the computer plays the role of the Soviet national defense and air force. Your task is to maneuver your B-1 bomber with tactical keyboard commands to elude an onslaught of anti-aircraft missiles and destroy squadron after squadron of approaching fighter planes.

It's not a fast-action arcade game. Planning and ingenuity are the ingredients of victory. **B-1 Nuclear Bomber** is but a mid-level challenge for the serious combat game strategist; yet

whether you're a rifle polishing hawk or an anti-nuclear pamphlet passer, you might find this game curiously intriguing. Don't buy this game if you're a parent who thinks toy guns are bad for

children: your kid will never be the same after disintegrating Moscow — and in its wake, the inhabitable earth.

The price to doom humanity to radioactive oblivion is a mere \$20.

## Bandits

*Sirius*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	7.0	<i>Documentation:</i>	7.5
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	7.5
<i>Originality:</i>	7.5	<i>Price:</i>	\$35

A gang of dastardly space bandits are stealing all your supplies, and they've got more than a dozen ways to do away with you. How about a nice napalm bomb, heat seeking missile, or exploding

nerve gas cannister?

This rapid-reflex video action game has twenty-eight levels of play. It can be played with joystick, keyboard, or paddle and accommodates one or two players.

## Blue Max

*Synapse*

<i>System Requirements:</i>	32K, disk; joystick	<i>Video Design &amp; Clarity:</i>	9.0
<i>Program Depth &amp; Detail:</i>	9.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.0
<i>Originality:</i>	8.0	<i>Price:</i>	\$35

Set in the midst of World War I, when the Allied forces were trying to hold Europe and the British Royal Air Force was the controlling power, Max Chadsworth became Blue Max.

Max lost his entire squadron to enemy fire and vowed to avenge their deaths. He shot down so many enemy planes they were offering a prestigious medal of honor to the pilot that shot him

down. You guessed it, it was called the Blue Max.

You control the aircraft with a joystick, pulling back on the controls to climb and forward to dive. Your machine gun is controlled by the firing button, and bombs can be dropped by lowering your altitude. Your altitude, fuel level, and state of your firing equipment is displayed on the screen.

As you are taking off, you must reach a speed of 100 mph or above before you ascend, or you will crash.

You have to accumulate a thousand points to be able to scroll over and bomb the enemy's airfield. After you bomb their hangars and grounded planes, you scroll back to the river. Your next goal is 5,000 points — which

enables you to buzz back into enemy territory to decimate their cities.

Throughout the game, you'll manipulate your vicarious ace through an unending series of aerial dog fights. The plane responds adeptly to your joystick controls, but only your trigger finger had better be swift.

Here's a useful hint: avoid head-on confrontation with an enemy plane. Chances are, you'll only collide. You'll only get one "life" and a single plane, so a kamakazi strategy is self-defeating. Nice graphics and a challenging pace contribute to a thoroughly engaging scenario. Your plane even casts a shadow on the ground below, providing an excellent *in situ* bombsite.

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## Bomber Attack

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Avalon Hill

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.0

*Support Availability:* 8.5

*Originality:* 7.5

*Video Design & Clarity:* 8.0

*Documentation:* 7.5

*Difficulty:* 7.5

*Price:* \$16

You're at the controls of a supersonic jet bomber, flying a dangerous mission over enemy territory. Your cargo is a load of 25 bombs that must be accurately dropped over key enemy locations.

The enemy is hot on your trail, so you'll have to destroy them quickly before they annihilate you. As provided in the Geneva convention, Red Cross hospitals are neutral territory, so be careful where you aim.

This arcade game of ground-to-air warfare is designed for one player, and a joystick controller

is optional. This game is fast paced, taking less than five minutes to complete a round.

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## Bootleg

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APX

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$25

All of the speakeasies in Chicago are counting on you to deliver a supply of bootleg booze. These guys don't like to lose money, so if you value your legs you will get there on time.

You travel through the city in your nondescript delivery wagon, keeping an eye out for the Prohibition agent in his patrol car. Not only are you disadvantaged with his car being faster and better equipped than yours, he can also set up roadblocks to slow you down.

In this moderately challenging chase game, you must maneuver your wagon around a maze, stopping when you see a goblet or flagons. Each time you make a delivery you are paid in points.

When you successfully complete ten deliveries you can move on to the next screen.

If you accidentally meet up with the Prohibition agent you crash and the game is over. You can set traps to throw him off your trail but each time you stop, you lose valuable time and points.

Pray for rain: a storm will jam the agent's radar, abetting your timely escape. Keep an eye on your fuel gauge displayed on the screen at all times; you'll have to stop for refills at various service stations scattered throughout the maze.

This game is designed for one to two players and is manipulated by joystick.

## Buried Bucks

*Analog*

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.5

You're on a treasure hunt for buried gold. Your archenemy, the devious Dr. Muta, is trying to beat you to it. The area you are searching in is so remote the only way to gain access to it is by helicopter.

You'll have to use high explosives to blast away the mountain where the treasure lies hidden. You only have \$2,000 to spend, the helicopter rental fee is \$240 a minute, and you must pay for ruining the environment at the rate of \$1.00 per cubic foot of earth displaced by your blasting. Of course, Dr. Muta will further confound your efforts by dropping tons of dirt on your blasting sight from his vintage World War II bomber. If you're not careful you'll run out of

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$30

money — and out of game.

You'll find it relatively easy to unearth the treasure in the first level. The helicopter can deftly dart in to grab the bucks and get out before the dirt starts to close off the entrance. You can replenish your supply of explosives by returning the money to your landing sight.

The second level is a bit more trying: the money is buried deeper, and you have to deal with the additional nuisance of water flooding the dig site. By the time you progress to level five, the good doctor has changed tactics and is firing heat-seeking missiles at you.

The game ends when you've lost your helicopters, money, or patience.

## Bug Off!

*Adventure International*

*System Requirements:* 16K, cassette; 32K, disk  
*Program Depth & Detail:* 7.5  
*Support Availability:* 7.5  
*Originality:* 9.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$30

You knew that particular area of Florida was famous for sink holes, but you bought the property anyway. Needless to say, your worst expectations came to pass: your garden fell into a sink hole, and some unexplainable force mutated all the insects into gargantuan prowlers. You might try DDT, but that was banned years ago and besides, where could you get hold of enough?

The object of this lepidopterous lampadedromy is to con-

trol seven variegated monster bugs before they trample everything in sight. Butterflies and moths spin poisonous cocoons; spiders and wasps have gone crazy; and caterpillars drop tiny ladybugs by the thousands. Your only hope is that the U.S. Army will be able to airlift the pesticide in time.

The graphics are nothing short of creepy, with all the sliminess and slitheriness of the real thing.

## Caterpiggle

APX

*System Requirements:* 24K, disk; 16K, cassette

*Program Depth & Detail:* 8.5

*Support Availability:* 8.5

*Originality:* 8.5

*Video Design & Clarity:* 8.0

*Documentation:* 8.0

*Difficulty:* 8.0

*Price:* \$25

**Caterpiggle** is a slinky, wriggling little creature whose favorite pastime is running around in a maze devouring snakes. Ah, but these snakes are crafty: they can split in two, grow longer, or break into little snaklets, like *Platymenthes Planarius*. Naturally, all this segmentation only makes life harder for Mr. Piggle.

Apparently, these are upper income demographic snakes; they have their own private, highly venomous, security guards. Should your vicarious Caterpiggle

bump into one on his daily rounds, he loses one of his three lives. Lose all three, and you lose the game.

You can vary the level of difficulty, taking on lengthier and more agile serpents as you develop increasing proficiency in wolfing down vermin. Of course, the longer the snake, the more time it'll take to digest.

Well, after all, it's a snake-eat-snake world — and another, run of the mill maze game with a vividly verminous twist.

## Centipede

Atari

*System Requirements:* 16K, cartridge; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 9.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$45

**Centipede** offers a bug's eye view of life in a mushroom garden. In this frantic action scenario, it's a bug-eat-bug world where the prime objective is to eat or be eaten. Your entourage includes poisonous spiders, lethal scorpions, pesky fleas, and the centipedes from whom the title is derived. All these cantankerous crawlers have one goal in common: they're all out to get you and your bug zapper.

Each time you successfully off a bug, it's magically reincarnated into a mushroom, apparently for no other reason than to clutter up the screen and make it all the more difficult for you to maneuver about the garden. To remove a mushroom, you'll have to zap it twice with your spray gun.

Ah, but those fiendish fleas have the power to create new mushrooms. The centipede wanders through the garden until it stumbles into a mushroom — at which point, the prolific

prowler changes direction and drops down one row. The point here is to destroy every section of the centipede before it makes it to the bottom of the screen. Fail, and the loathesome leaper divides into a veritable nursery of baby centipedes. If you only manage to chop the bug in two, both halves go their separate ways — leaving you with one more hideous hiker to contend with.

Now, the scorpions have their own private perils to offer. When they run into a mushroom, they inject it with a neurasthenic poison capable of driving centipedes over the brink. A crazed crawler will charge your bug blaster mindlessly, disregarding all risk.

This game is played with a joystick on a horizontal screen. For every 10,000 points you accumulate, you'll be awarded a bonus blaster. You can keep up to six blasters in reserve.

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## Chicken

*Synapse*

**System Requirements:** 16K, joystick  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.5  
**Originality:** 8.5

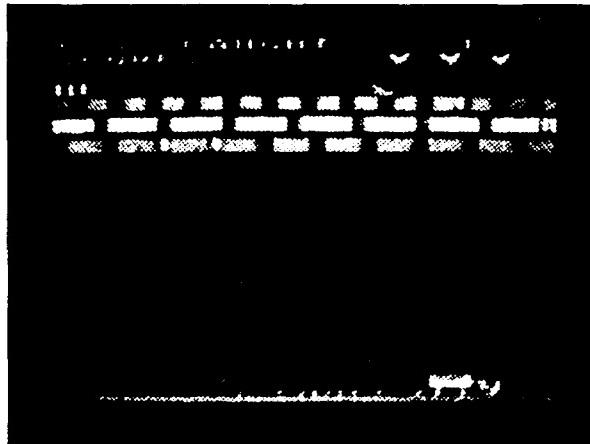
**Video Design & Clarity:** 8.0  
**Documentation:** 8.0  
**Difficulty:** 8.5  
**Price:** \$35

Here's a delightful comic action game for early learners and those elite afficianados of cartoon chickens. Charming graphics and a hilarious premise contribute to the experience.

You see, Mr. Fox has made off with the future progeny of Mrs. Hen; as you boot the game, you'll see the elusive scoundrel hiding in the rafters overhead. Merely from spite, he'll begin dropping the eggs one by one to splatter indignantly on the ground below.

It's up to you, as the vicarious Mrs. Hen, to race back and forth beneath the rafters pushing your rusty egg cart in position to catch each falling offspring. Miss, and you'll have a nasty mess.

The eggs you manage to save will inevitably hatch as you continue scampering around, further complicating the game, as well as the video display.




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## Clowns and Balloons

*Datasoft*

**System Requirements:** 16K, disk or cassette; joystick  
**Program Depth & Detail:** 6.5  
**Support Availability:** 8.0  
**Originality:** 7.5

**Video Design & Clarity:** 8.0  
**Documentation:** 7.0  
**Difficulty:** 5.5  
**Price:** \$25

This arcade adaptation is designed especially for the youngest computer user in your family. The computer displays three rows of multi-colored balloons at the top of the screen. The player controls a pair of assistant clowns holding a trampoline. The object is to continually position the trampoline under a leaping acrobat to successfully catapult him up to one of the balloons. When the agile clown

brushes against one of the balloons, it pops.

The ultimate objective, of course, is to burst them all. When there are plenty of balloons, it's virtually impossible to miss; but as you thin out the rows, you'll find your aim has to be accurate. You see, the clown's trajectory depends on the angle at which he lights down on the trampoline.

The computer supplies you with three acrobats per game.

## Computer War

*Thorn EMI*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

After a tedious search, your autodialer finally stumbles across a new user network. On a vivid map of the North Atlantic seaboard a myriad of iridescent pinpoints depicts the American defense system. Assuming it's some dazzling new network game, you immediately begin decoding the command to arm the entire nuclear arsenal. Unknown to you, you've just cracked the real National Defense System, and in less than an hour, every man, woman, and child on the planet will be radioactive dust...

If this scenario seems familiar, you've seen the movie "War

Games," on which this intriguing simulation game is based. In this version, the computer plays the role of Norad, the supercomputer that controls the American arsenal; not knowing the difference between simulation and actuality, it blithely proceeds to launch a total thermonuclear attack on the USSR.

The system is at a state of peace or in DEFCON 6, when suddenly unidentified blips appear on the screen. Your job is to stop the onslaught before the world perishes in a puff of cathode mist. As the game begins, the military is on full alert

and the Russians are preparing a counterattack. You'll have to crack the code, track the missiles, and destroy them before they hit their targets.

A splendid graphic treatment and a terse plot make **Computer War** one of the most intriguing video games on the market.

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## Crater Raider

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*Boone*

*System Requirements:* 32K, disk; joystick  
*Program Depth & Detail:* 9.0  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$35

The Earth is headed for a collision course with an asteroid. Your mission is to destroy the asteroid and any aliens that may be lurking on its surface. You have a limited supply of oxygen and time is your enemy. As if that weren't enough, an interminable barrage of meteorites bombards the surface — leaving gargantuan craters for you to negotiate. Naturally, an angry brood of aliens may decide to attack from all sides at once. Set the explosives in time, and you may just save yourself and the

Earth to boot — assuming, of course, that you remember to set the timing mechanism for a three minute delay to escape.

Vivid graphics, a frenetic pace, and variable difficulty make this program a consistent and captivating challenge for the intermediate joystick pro. This is a full color action game with sound effects, twenty screens, and nine levels of difficulty. It is designed for one player and can be manipulated with a keyboard, joystick or paddle.

## Crossfire

Sierra On-Line

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 7.5  
*Support Availability:* 8.0  
*Originality:* 6.5

*Video Design & Clarity:* 8.0  
*Documentation:* 6.5  
*Difficulty:* 7.5  
*Price:* \$30

The invading ships descend like hail from the invisible galaxy beyond the range of your scanner. Only a handful of fighters stand between the conquering enemy and the cowering humanity behind you. Take a deep breath; the first furious fusilade has been unleashed.

**Crossfire** is a strategic target game that combines an Alien Invaders theme with a board-game format. The object is to maneuver your ship through the streets of the abandoned city, vollying for position to blast the scorpion-like aliens, while eluding their return fire. You only have 35 missiles of your own, so your

aim has to be good.

The game is played on a grid defined by 42 squares. The spaces between the squares are the "streets" where your defenses make their stand.

The game has only average graphics but will try the hand of most beginning combat strategists. It supports both keyboard and joystick play, though the keyboard mode is clearly the more challenging. Don't worry about the scenario being repetitive: it'll take a dozen or so plays just to get the hang of co-ordinating your ships and firing with any accuracy.

## Dandy

APX

*System Requirements:* 40K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 7.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$30

**Dandy** is a twenty-six level adventure game controlled by joystick. In this gothic laugher, you and as many as three other

players band together to escape from a musty dungeon.

You'll have to sneak past ferocious monsters that drain

your psychic energies and inspire your appetite at the same time. Run into one, and your sustenance level will drop, detouring your quest for freedom as you search for replenishment.

It's possible you'll end up depleting all your available energy, in which case your soul will beat a hasty departure from your pitiable anatomy and proceed directly to Limbo. However, rejoice at the possibility you may not have to tarry there indefinitely. A fellow questor can retrieve you to the dungeon by piercing your aortic arch with an arrow.

As you traipse along through the labyrinthine caverns, you'll stumble across a few conveniently abandoned bombs. Naturally, you'll want to gather them up for

future use. Heaving them at the monsters will provide you with ongoing visual effects and prolonged livelihood. As you scourge around for food, keep a vicarious eye out for the key that will unlock the mystical barriers to the next dungeon (or dimension, whichever it's supposed to be).

The joystick guides your team of weary wanderers from dungeon to dungeon. Keyboard commands will hurl your bombs and replenish your depleted strength. Having to use both at once may require a little more coordination than you're willing to expend on this game. However, if you grow bored with your dingy dungeons, you can create your own with a built-in maze editor.

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## David's Midnight Magic

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*Broderbund*

**System Requirements:** 32K, disk  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.0  
**Originality:** 9.0

**Video Design & Clarity:** 9.5  
**Documentation:** 9.0  
**Difficulty:** 8.5  
**Price:** \$35

This is the definitive electronic pinball program, with exceptional graphics qualities and a frenetic pace. Computerization makes the experience a lot flashier and far more challenging than the old mechanical nickel-eater of yesteryear.

Using high-resolution anima-

tion, this pinball propagator has all the action effects of the real thing — flippers, flops, flaps, deflectors. You can set the complexity and speed to your own liking.

The best approach is to practice at beginner's level until you get the hang of controlling the

electronic flippers, then launch right into the highest degree of difficulty.

The game is strictly for pinball wizards and the would-be.

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## Deadly Duck

Sirius

*System Requirements:* 32K, cartridge  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$35

Deadly Duck's only job in life is to destroy his enemies, the Crabs and the Dragonflies. As the debonnaire Deadly dawdles in the pond, he deftly blasts his targets from the heavens, being careful to avoid falling bricks and Dragonfly bombs. If he happens to miscalculate, he will surely drown.

At each level of play there are eight Crabs waiting to get poor Deadly. Their bricks can stay afloat for short periods of time, blocking Deadly's path. If one of these bricks should hit its target,

it's Peking Duck for our frenetic feathered fellow. The Dragonflies are indestructible little devils, but if you do manage to hit one with a Bill Bullet, you gain ten points.

You start each game with four ducks. You get a fresh DD when all eight Crabs are shot in each of the six levels of play. You may acquire an unlimited quantity of surplus ducks, but only three can be applied in action at any given time.

This game accommodates one player and is manipulated by either a keyboard or joystick.

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## Deluxe Invaders

Roklan

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 8.5  
*Price:* \$35

As you may have surmised, this game is a hybrid of the over-played Space Invaders genre taken to a logical absurdity. The action is frenetic and the level of difficulty so overwhelming that it's not a matter of trying to win, but merely trying to hold out a few seconds longer than the next player.

As is typical of this mold, the object of the game is to disintegrate alien intruders one by one (aliens from outer space, not migrant farm workers from Baja). To humble the arcade wizards who found this premise too simple to master, this game has a special twist to thwart any possibility of prolonged play. Each time you blast an alien, it replicates itself into two new aliens. What then, you might ask, is the point of blasting them in

the first place? Following the usual method of play, you'll only succeed in increasing the alien hordes that descend over the surface of your defenses. Not only that, but you'll have to constantly elude a hail of death bombs that these new and better-equipped intruders have brought along for the invasion.

It is possible to destroy one, but only one of these second-generation progeny. Blast one accurately three times in succession, and the hybrid alien will finally go away. In effect, you'll end up having to blast each original alien no fewer than seven times to eliminate it and its replicated selves. Of course, while you're preoccupied doing that, the remaining alien horde continues to drop death bombs as they make their way to the surface.

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## Dig Dug

AtariSoft

*System Requirements:* 32K, disk or cartridge  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 7.5  
*Difficulty:* 8.5  
*Price:* \$35

This Atari release is faithful to the arcade game. Dig up unbeatable scores by escaping through a malleable environment. Unfortunately, the graphic quality is disappointingly thin com-

pared to the original. The response time is also a bit lethargic, with a noticeable lag between the time you make your move and your vicarious digger makes his.

The game is only an average challenge to any master of machinery madness, but if you

liked the quarter-eater especially well, you may appreciate having a diskette version at your fingertips.

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## Dino Eggs

*Micro Lab*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 8.5  
*Documentation:* 7.0  
*Difficulty:* 8.0  
*Price:* \$40

Perplexed by why the dinosaurs vanished? Maybe it was a comet plummeting to earth, washing the world in a lethal mist. Or, maybe there was a spell of glacier temperatures and desolate winds. Or maybe, somebody went around breaking all the dinosaur eggs.

No doubt, it was the latter. In which case, you have a perfect opportunity to deviate the fate of our reptilian predecessors by traveling back in time and making off with the **Dino Eggs**.

This fast-paced action game is based on just such a scenario — or rather, infinite set of scenarios. Each game is randomly generated to provide a unique backdrop and puzzle. The player can choose from one of nine levels of challenge.

This is a nicely illustrated program that makes use of the latest high-resolution graphic techniques. It's a decent arcade-style activity for youngsters, priced at \$40.

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## Donkey Kong

*AtariSoft*

*System Requirements:* 32K, disk or cartridge; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

This high-resolution release from Atari is faithful to the arcade game, complete with you-know-who hopping about in the prototypical absurdist jungle game. Only this jungle is made up of steel beams and skyscraper profiles.

The program unleashed a slew of imitators based on the concept of hoppy trails and multi-level perils. You see, Mr. Kong has stolen your gal — not just her heart, but her entire physiognomy — swept her up off her feet and hauled her off to the concrete jungle. To effect a rescue, be prepared to hop to the occasion (or to safety).

This is a fair approximation of the original, though the response time is noticeably lax. If you're proficient with the quarter-eater, you may have to practice with the joystick a bit to adapt your timing.

This game is strictly for lever lovers who adored Mr. Kong in the arcade. Others may find the program uni-dimensional, despite the simulated 3D graphics. If you're one who suffers from that new medical anomaly identified in the journals as Chronic Arcade Wrist, you'll find vicarious leaping and lunging every bit as aggravating as scuttering about in a maze.

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## Downhill

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APX

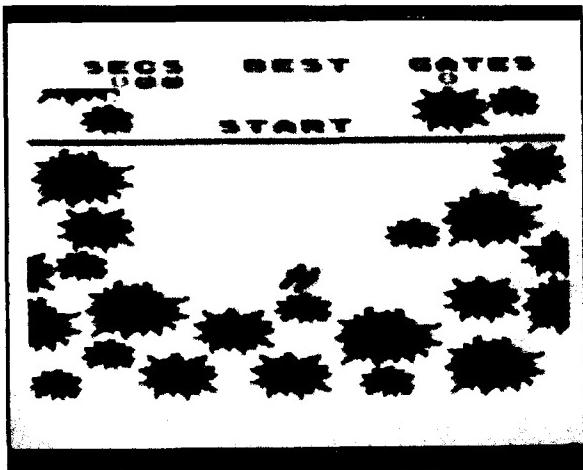
*System Requirements:* 16K, cassette; 32K, disk; paddle  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$25

Here's a vicarious, if indolent, pastime for the ski enthusiast entrapped in the teeming metropolis for the weekend. **Downhill** gives you free reign over the slopes, but you'll find wrist-eye coordination more crucial than ankle movement and style. A game paddle directs your alter ego around and through the gates, hopefully avoiding collision with the miscellany of trees that line

the slopes. You have the option of previewing the course before you run it, or hurling blindly off the edge armed with nothing but brute courage.

**Downhill** supplies beginning, intermediate, and expert courses for you to negotiate. Besides selecting the level of difficulty, you can change the degree of slope to increase or decrease the speed at which your vicarious



skier travels along different segments of the course.

As a downhill racer, you compete against the clock. The object is to arrive at the bottom of the slope, making all of the gates, in the least possible time.

The computer keeps track of the best time on each course level, so you can compete against your best time or that of another player. This program features sound effects, vertical scrolling and player missile graphics.

## DragonHawk

*Creative Software*

*System Requirements:* 48K, disk

*Program Depth & Detail:* 8.0

*Support Availability:* 8.0

*Originality:* 8.0

*Video Design & Clarity:* 8.5

*Documentation:* 7.5

*Difficulty:* 8.0

*Price:* \$35

With a flurry of wing you rise to battle. A fire breathing serpent has hexed the creatures that roam these mountains, and now the ghastly guards patrol their evil master's domain. You must destroy them all before you can reach the serpent: the carnivorous cadre includes buzzards, iguanas, and phoenix birds. For extra measure, you'll also encounter, bats, dragons, and giant mosquitos.

Manage to overpower them, and they'll magically metamorphise into harmless feathers,

which you must collect to rack up points toward an extra life or two. If you fly too slow, your speed will induce a vengeful lightning storm capable of grounding you for good.

If you do manage to survive, you'll run into the evil one himself. Though he may seem indestructible, there are ways to outwit him. Discover his Achilles heel and you'll free the mountain creatures from his spurious spell.

You can accumulate up to twenty-four lives to fritter away as you blunder through battle.

**Drelbs**

Synapse

*System Requirements:* 32K, disk; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.5  
*Difficulty:* 9.0  
*Price:* \$40

Frenetic, macabre, highly surrealistic, this hybrid maze game from Synapse is one of the most addicting action games in its genre. The graphics are intriguingly cynical and occasionally hilarious — combining geometric simplicity with grotesque characterization.

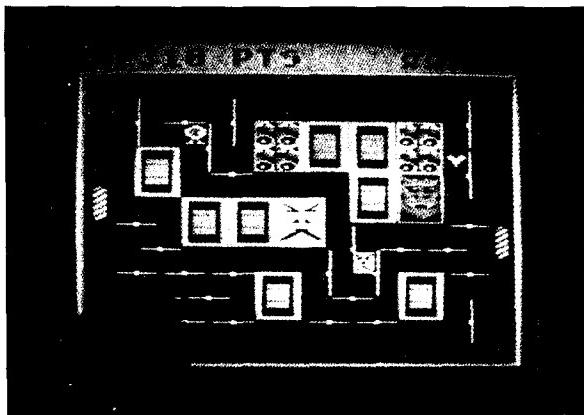
You vicarious "drelbs" are stoic, ambulatory eyeballs with squat ankles and floppy feet. They scamper about through corridors constructed of hinged walls, occupying themselves by assembling glowing, phosphorescent boxes. Unfortunately, there's an unsightly cadre of sadistical squares intent on razing your cubical contrivances and helping themselves to a little **eyeball tartare** in the process.

The sinister countenances range from a nasty frown-face to a gloating Frankenstein. You can

elude them as best you can — or box them in with a quick slam of a few well-selected walls.

**Drelbs** is a decent challenge for even the experienced arcade maestro. Strategy and planning figure as prominently as wrist-eye coordination.

A joystick is required to operate this game; there are no codes for iterating an eyeball itinerary at the keyboard.

**Embargo**

Gebelli

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 7.5  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$45

This quickly paced action scenario is representative of a class of video games involving high-speed air maneuvering through a tortuous course. In this variation, you're the pilot of a cargo shuttle tasked with violating a galactic embargo. You'll have to elude a fleet of elite guards and negotiate the structures that line the base. The object is to secure your cargo and

return safely to your mothership, avoiding the aim of a robot patroller. To further complicate your efforts, various debris will hail down from the surrounding buildings as you make your way through the obstacle course.

The computer gives you an initial shuttle and three replacements to accomplish your mission of selectable difficulty.

## Encounter

### Synapse

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 9.0  
*Documentation:* 7.0  
*Difficulty:* 8.0  
*Price:* \$35

On a planet much like Earth, created as the ultimate test for the greatest warriors of a forgotten race, a battle is about to be waged. No one has stepped foot on this planet for at least a

billion years. And no one will for a billion more: you're safely seated in your supertank, ready to lash out against all odds.

**Encounter** is a three dimensional tank warfare game. The monitor gives you a lucid perspective of your vehicle's control panel mounted below an observation window, through which the tortuous terrain spans out beyond the horizon. The instruments consist of three detectors and a sensitive scanning device to locate hostile enemies.

The program offers three levels of play, each with different terrain and a random quantity of attackers. No two opponents will



do battle with the same strategy. Manage to destroy them all, and a black, inter-dimensional door will unlatch. Congratulations, you pass the ultimate test.

Splendid graphics and excellent response give this realistic simulation high marks for originality and overall amusement value.

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## Final Orbit

*Sirius*

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$40

This splendidly designed galactic encounter features a unique scenario with a multiplicity of game factors influencing the likelihood of success. The game is conducted from the perspective of an orbiting Earth space station, with the planet's surface hazily visible at the bottom of the screen.

Though the premise is unoriginal, the approach is unusual. The Earth is under attack from an invading force of satellites of starfighters. The fighters conduct periodic strafing missions low over the surface of the planet. The player commands a space "destroyer" charged with tracking down and blasting the invading craft.

To aid you in your pursuit, a

radar display will advise you of an enemy fighter's general proximity. The first challenge is getting one of the fighter craft onto the monitor screen; from there, it's only a matter of unleashing your fusilade.

As the game progresses, you'll undoubtably run low on energy. The only way to replenish your power is to track down and obliterate an enemy starbase.

The producers have named the erstwhile invaders the "Malandroids," but you'll probably have as much fun imagining the raiders are Soviet space fighters in a futuristic war scenario. Congratulations to Sirius Software for a well conceived treatment of an otherwise hackneyed theme.

## Firebird

*Gebelli*

*System Requirements:* 16K, cassette; joystick  
*Program Depth & Detail:* 7.5  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.0  
*Difficulty:* 8.0  
*Price:* \$40

A pyromaniac bird is dropping fire bombs on the city. The only one qualified to fight the blazes is Piggo, firefighter extraordinare. He rushes to rescue the trapped occupants of the engulfed buildings, saving them from certain death.

You control the actions of Piggo with your joystick controller. You help him scurry up ladders, position and hold the water hose. Fire bombs drop every ten seconds, so you'll have to rush Piggo to the scene quickly and position his ladders as soon as the first flames appear.

If you're fast enough, you might succeed in saving the foundation, avoiding the collapse of

the entire building. Of course, your efforts may be hampered by stranded victims deciding to make a jump for it. If you rush to catch a hapless citizen, you'll be stymied by the raging fires. A helicopter hovers overhead to transport the victims to safety. As a reward for your humanity, it will drop in a replacement building on its return.

If your concentration wavers, you're likely to lose all the buildings, not to mention the game. The game ends as soon as two parts of the building burn and collapse. You and Piggo score points for saving victims and putting out the flames.

## Flying Ace

*Avalon Hill*

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 8.0

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$26

You're a World War I bi-plane fighter pilot, and your mission is to attack and destroy the truck

convoy carrying ammunition and supplies to the front line. Flying expertise is essential to the success

of your mission.

You'll have to effect loop to loops, climbs, and daring dives to elude the enemy and make your drops. Attack squadrons will

follow your every move the minute you become airborne.

This arcade style game is designed for one to two players and is controlled by joystick.

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## Frogger

*Sierra On-Line*

**System Requirements:** 32K, disk; joystick  
**Program Depth & Detail:** 7.5  
**Support Availability:** 8.0  
**Originality:** 9.0

**Video Design & Clarity:** 8.5  
**Documentation:** 7.5  
**Difficulty:** 8.5  
**Price:** \$35

Put yourself in the place of this poor little frog trying to cross a freeway and stream. The main thing is to survive the trip without getting squished, bitten, drowned, or eaten.

When your frog escorts a female frog home, eats an insect, or beats the clock, both of you score. You can set the action at a

slow or fast pace, depending on your reflexes and mental alertness. Not only that, you get an extra frog for every five crossings.

This classic action game deserves its reputation as a fast-paced scenario with hand-eye challenge and cynical graphics.

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## Fort Apocalypse

*Synapse*

**System Requirements:** 32K, disk or cassette; joystick  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.0  
**Originality:** 8.5

**Video Design & Clarity:** 9.0  
**Documentation:** 8.0  
**Difficulty:** 9.0  
**Price:** \$35

Your mission is to destroy the Kralthans and their Fort Apocalypse before they get you. You begin this ostensibly dangerous mission at your fuel depot. Once you have refueled your jet helicopter, you must fly to the Draconis caves and drop your cargo of bombs through access doors.

Assuming you successfully gain entrance to and demolish the first level of defense, you must subsequently maneuver through a labyrinth of the caves. You must blast your way through impact shields, reaching chambers and elevators, so you may find and

rescue eight prisoners.

You have an unlimited supply of bombs, mines, and rockets to destroy tanks, access doors, and shields. However your fuel supply is limited: you'll be wise to keep any eye on the fuel gauge displayed to the left of the command bar. Also displayed for your navigational edification is a standard, run-of-the-mill Navatron, which supplies you with information about the surrounding terrain and the number of enemy units in your area.

This action game accommodates one to two players and is controlled by joystick.

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## Game Machine

*Program Design, Inc.*

*System Requirements:* 16K, cassette; 32K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$35

The **Game Machine** is a set of five interactive computer games designed for family play. The complete set includes the following titles:

- "Gotcha," an arcade style game for one or two players. You must manipulate the joystick to avoid running into yourself, the edge of the screen, or the other player.
- "Racing," a simulated horse race, including paramutual bet-

ting. One to four players can place their bets, either losing their shirts or walking away a winner.

- "Bowling," a simulation of the actual game. All the same rules are observed. Up to four players can roll gutter balls down this simulated alley.

- "Leap Frog," a puzzle program. You have to move those frogs that are facing left so that they are sitting on the left side of the screen, and vice versa. This

feat of transposition must be accomplished in the least amount of moves to win.

- "Musical Letters," an educational word game designed for

one to two people. You must discover mystery words by guessing each letter by its musical tone.

## Getaway

APX

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$30

Let's face it: you're small time. Sure, you've been hitting up all the choicest banks and convenience stores in town, but no matter how you cut it, you're just a punk. You stashed all the loot in your hideout, but now the heat is on.

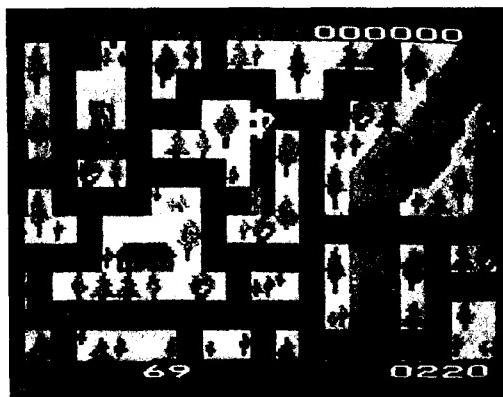
In the beginning you promised yourself it would only be small easy jobs. Then you got yourself in big trouble when you knocked off the armored car. Now the cops are on your trail.

In this puerile fantasy, you drive your getaway car around town collecting as much cash as you can. When you think you've got all the loot you can handle, you hotfoot it to your hideout and stash away the ill-gotten booty. But don't go overboard: the more you carry the more interested the cops become! When you want to pull that big heist, be sure to stop and fill the tank, one

of those minor details you might tend to forget.

A radar system helps you detect where the cops are hiding and where armored vans are parked. When you make off with three prizes, and knock over the van, you can continue to the next level. With each level of difficulty, you'll find a corresponding booty of ripoffs to consummate and cops to elude.

This game is designed for one player, using a joystick to maneuver around town.



## Hard Hat Mack

*Electronic Arts*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$35

The diligent construction worker is trying to construct a building and at the same time avoid the hard nosed OSHA inspector, falling objects, and other miscellaneous hazards of the job site. There are three separate screens to this game.

The first shows a five story building still under construction. Your job is to put the girders in the correct holes in the completed framework. You then have to secure them in place with rivets; the tricky part is catching the gun. While you're preoccupied with your labors, the ostentatious OSHA inspector is running after you trying to find reasons to cite the company. Meanwhile, a hail of rivets rains down unpredictably from on high.

You travel from floor to floor via elevators, ropes, and a spring board. If you should die before you have completed your task or your shift, your next man must pick up where the other left off.

The second screen is easier to get through and has more in-

teresting graphics. You have to grab all of the tool boxes left on each of the building floors. The ever-present OSHA inspector is watching your every move from the street. Many of the floors are incomplete, so caution is required. When you manage to collect all of the tool boxes, a giant magnet arrives and lifts you to safety.

In the third screen you're tasked with picking up a miscellany of scrap steel blocks lying around the job site, then placing them in the rivet machine. The two opposite walls of the building aren't connected, and one misplaced step will send you plummeting into live electrical wire — or worse, into the chemical toilet (My, such realism).

With only three screens, you'll find the challenge relatively short lived. What the game lacks in graphic quality it gains in pace. You can choose any screen in which to begin play by pressing a number from one to three before you start.

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## Haunted Hill

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*Swifty Software*

**System Requirements:** 16K, disk or cassette; joystick  
**Program Depth & Detail:** 7.5  
**Support Availability:** 7.5  
**Originality:** 7.5

**Video Design & Clarity:** 7.5  
**Documentation:** 7.5  
**Difficulty:** 8.0  
**Price:** \$30 disk  
\$25 cassette

**Haunted Hill** places you in a dimly lit cemetery at the stroke of midnight (the vampire happy hour), desperately fighting off a swarm of vampire bats intent on a round of fresh Bloody Maries.

The object is to destroy the thirsty bats before they make it to the bottom of the screen. If your aim is bad — and you keep missing the bats and hitting the headstones — you'll be in for an unpleasant surprise. It seems the occupants of these graves don't take kindly to disturbances of their peace. Hit a headstone

several times, and a ghost will appear.

Fortunately, these ephemeral forms are as vulnerable to rifle fire as the vampire bats. But should ghost or bat touch your tremorous alter ego, you'll become a permanent resident of the cemetery yourself.

You control your character with a joystick. You can move horizontally but not vertically, but if you stumble off the side of the monitor, the computer wraps you around to the other side.

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## Humpty Dumpty/Jack and Jill

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*Thorn EMI*

**System Requirements:** 16K, joystick  
**Program Depth & Detail:** 6.5  
**Support Availability:** 8.0  
**Originality:** 7.5

**Video Design & Clarity:** 8.0  
**Documentation:** 7.0  
**Difficulty:** 5.5  
**Price:** \$30

Poor Humpty, he's been victimized by a bored Atari programmer at Thorn EMI. It seems his shell has been zapped into tiny squares and reshuffled to form a puzzle. Now, all the Atari

horses and all the Atari kids must use their Atari joysticks to restore Mr. Dumpty to reasonable health.

Jack and Jill aren't in much better shape themselves. It seems

poor Jack has fallen on his noggin and cracked open his cranium into a similar miscellany of squares. Well, children, it's up to you to reconstitute the unfortunate boy's skull with your surgical insight and

your Atari joystick.

You can choose how many pieces into which you'd like Humpty's shell or Jack's head shattered — in four levels from nine to thirty-six.

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## Jawbreaker

*Sierra On-Line*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 7.0  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.5  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$40

Here we go again, avariciously gobbling as many disks as we can, while trying to keep ourselves out of the jaws of our pursuers. Only this time, we've also got to navigate through a gravity-less medium suspended in space.

There's no maze, walls, or blockades to negotiate. Instead, you have to maneuver your way through a series of doors that zip across the screen.

Your alter ego is no puffy-faced cheerio, either. In this game, you're a set of clacking teeth complete with gaping gums.

Looking like something from the cover of a Mick Jagger album, you scamper around in space pursued by a horde of sickening happy faces.

The added dimension, hilarious design concepts, and dream-like backdrop add a touch of surrealism to this well worn dot-eat-dot scenario. It's not only a tad more challenging, but considerably more appealing, in a wry, cynical kind of way. There's a real pleasure in destroying those glaring, mesmerized happy faces you've probably hated all your life.

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## Jumbo Jet Pilot

*Thorn EMI*

<i>System Requirements:</i>	16K, joystick	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$45

This cartridge program is part flight simulator and part game, scoring players based on their proficiency in manipulating the controls and reading the instruments of a prototypical airliner.

The display places you in the cockpit behind the throttle of a comic book jumbo jet. The lower two-thirds of the monitor screen are devoted to a crudely designed but legible instrument panel. Your "instruments" are more like icons than digital displays, but at least they serve their respective purposes well, giving you fuel readings, elevation, altitude, speed and direction. Your perview of the outside world is limited to the meager third of the screen peeping above

the control panel.

You begin the game by selecting from five levels of difficulty. With your instruction booklet at your side, you maneuver the aircraft with keyboard commands or joystick control — first taxiing down the runway, then (hopefully) lifting off into a clear azure "sky." The computer subtracts from your initial supply of a thousand points, as you blunder your way through air maneuvers. You'll lose points when you stall the engine or overaccelerate.

As flight simulators go, this game is deficient on accuracy, graphic quality, and responsiveness. However, it's one of the few products in this category that scores players based on their progress.

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## Jumpman

*Epyx*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	7.5
<i>Program Depth &amp; Detail:</i>	7.0	<i>Documentation:</i>	7.5
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.0	<i>Price:</i>	\$40

Jupiter headquarters has been infiltrated by aliens. Bombs have been planted throughout all 30 levels ready to detonate at any second. You're the government's top secret weapon — the only one who can defuse the bombs and restore communications to the frantic planet.

Of course, you'll first have to gain access to the hidden interiors and mazes of the headquarters complex. Naturally, the routes are perilous, replete with crumbling girders and attacking archenemies.

The computer gives you seven lives to accomplish the mission.

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## Lode Runner

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*Broderbund*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 6.5  
*Difficulty:* 8.5  
*Price:* \$35

**Lode Runner** is an inventive multi-game environment with a galactic theme. The player can design his own set of challenges, from obstacle courses to elusive targets. The premise poses the player as a rebel commando searching for a stolen fortune in the complex confines of a space station controlled by the peace-hating Empire.

Burst through floors, dash up ladders, bounce over barriers to

elude the Empire's stormtroopers and make your way to the gold. Before you get started, specify your own platforms, ladders, and trap doors in accordance with your own proficiency.

**Lode Runner** has a rapid pace and requires keen eyesight. You'll have to manipulate your little animated commando with almost zero response time. The program's flexible design adds to its long term appeal.

## Lunar Leeper

*Sierra On-Line*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	7.5	<i>Documentation:</i>	7.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.0
<i>Originality:</i>	8.0	<i>Price:</i>	\$30

This is a flashy, highly colorful action game with a high-tech theme. In fact, the best thing about this game is its ambitious graphics. The premise places you on the moon where you've been charged with a mission to rescue a stranded crew. Poised between you

and success are the lethal leepers.

This is a mildly amusing game based on a familiar — if craftily disguised — premise. If you've already got one of these leaping-eluding action games, you probably don't need this one. Unless you've got \$30 to spare.

## Maniac Miner

*Gentry*

<i>System Requirements:</i>	48K, joystick	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	7.5	<i>Price:</i>	\$20

With games like this that so obviously imitate other, more popular products, it's difficult not to compare them one-on-one against the "originals." This program falls squarely in a category of peril-fraught mining games, some of which take place in subterranean mazes, others in labyrinthine asteroid belts. This one most closely resembles "O'Riley's Mine," pitting the player as a frenetic and greedy

Goldbricker menaced by a miscellany of unruly creatures.

In this fast-paced action scenario, your foes will be represented by poisonous bats and spiders. The object is to maneuver through the multi-leveled shafts to gather up glittering jewels lying conveniently about in random locations.

The game requires a joystick and offers nine selectable difficulty levels.

## Meltdown

*Cosmi*

*System Requirements:* 16K, disk or cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.5

Nuclear power plant simulation is the subject of a growing class of software for both leisure time and educational applications. This crude video action scenario is strictly for "fun" and recommended for younger computer users in their early teens.

The graphic qualities of the program are shamefully poor. The display is a mere set of amateurishly drafted symbols presumably intended to represent the cooling system of five nuclear reactors. The premise is a system

*Video Design & Clarity:* 7.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$13

failure that threatens to melt down the core and malign the pro-nuclear energy establishment (and diminish property values) by hailing gamma radiation over the surrounding neighborhood.

As the hero of the hour, you must use your joystick to maneuver a racing stick figure into the interior of each reactor in quest of the dangerous uranium rods. Your mission will be hindered by radioactive meanies.

## Microsailing

*APX*

*System Requirements:* 32K, disk; joystick; Atari BASIC  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

This program gives you the feeling of owning and sailing your very own yacht without the major financial investment or the headache of battling Mother Nature. The simulation is fairly accurate, but you'll miss the wind

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$30

caressing your brow and the hot slap of the sun against your cheek. On the other hand, you won't get drenched by a sudden wave or moan in agony as an unseen boom bangs against the side of your head.

This racing program is designed for one to two players and has four levels of difficulty to choose from. Before you begin, a yacht runs through the course ahead of you, illustrating how the marks should be maneuvered. You negotiate the buoys on the course using a joystick as your tiller. Your speed depends on your sailing ability and the weather conditions. If you are an experienced yachtsperson you can elect to in-

crease the challenge by sailing in stormy seas.

There are two sets of rules you can follow with this game. Standard rules ignore collision between crafts; in advanced play, you must observe the right of way rules. The game ends when the first player reaches the finish line and has successfully rounded all of the marks.

This game requires an Atari BASIC Language Cartridge.

## Miner 2049er

*Micro Lab*

<i>System Requirements:</i>	16K	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	7.5	<i>Documentation:</i>	7.5
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.0
<i>Originality:</i>	7.5	<i>Price:</i>	\$30

Mining in the year 2049 is no snap. Radioactive mutants, lethal ponds, and a perilous shaft are on your everyday agenda. Don't bother going on strike to improve working conditions. Just climb on down all four levels of your tenuous burrow and snatch those apple gems.

Along the way, please don't fall through a gaping hole, trip over a sliding plank, or get mugged by a menacing mutant.

This multi-tiered action game

challenges you to trace all four platforms of a danger-laden structure, eluding destruction and outwitting disaster. Each lower level of the mineshaft brings a higher level of difficulty. Good thing you have three lives to expend.

The program has good production values, including above average animation, and varying degrees of challenge. It's an interesting action-style update of a conventional prose-adventure plot.

## Moondust

Creative Software

*System Requirements:* cartridge; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.5

*Video Design & Clarity:* 9.5  
*Documentation:* 9.0  
*Difficulty:* 7.5  
*Price:* Quoted by Vendor

This is an unusual game program that excels in visual and musical sound effects. A welcome contrast indeed to the creak of robot men jerking across the stage, or the violent pops and whizzes of guns and bombs, **Moondust** is lovely to watch and mesmerizing to listen to. As you play chords, the tempo will follow the movements of your joystick. Connect the sound to your stereo system and enjoy the hypnotic effect of this computer generated music. Colors swirl and dance in circular movements as you move your spacewalker and moondrop ships to "spread the seed". The display of colors is delightful to watch and the movements relaxingly paced.

There are four variations — Beginner, Evasive, Freestyle, and Spinsanity. The object of the

game is to drop a "seed" from your spacewalker at a distance from the center of the screen that will enable you to use your moondrop ships to "smear" the seed back into the center of the screen (or "energy field") for a bull's eye. When you start the game, you're at ease to drop a seed whenever you like; but once you unload, the seed rapidly evolves into expanding geometric patterns of colorful squares that you must try to move and control with your joystick.

As you can easily visualize, there's little structure or competitive striving in this game. Winning or losing is beside the point; the idea is simply to revel in the graphic explosions of your own imagination — and the computer's vivid palette.

## Moon Shuttle

Datasoft

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$30

Your shuttle trek started out like any other mission, dull and tiring. While you were dozing, an army of enemy spacecraft surrounded your ship. You struggle to gain control of all your senses.

Enemy rocket launchers race in and out of your firing range with mind boggling alacrity. You encounter asteroid showers, man-o-wars, and expandos; ubiquitous blob men attack with unrelenting furor. Destroy one and two more appear.

Cheer up: if you somehow manage to survive this scenario, you can look forward to

repeating your effort at a faster, more difficult pace.

You earn between twenty and ninety points for each target you blast from the sky. Make it through the asteroid belts, and you'll get additional points. For each enemy mystery ship you destroy you're awarded another shuttle. You can also increase your fire power by accumulating 10,000 points.

This game can be played by one or two players and is manipulated by either keyboard or joystick.

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## Mouskeattack

Sierra On-Line

*System Requirements:* 48K, disk

*Program Depth & Detail:* 7.0

*Support Availability:* 8.0

*Originality:* 8.5

*Video Design & Clarity:* 7.5

*Documentation:* 8.0

*Difficulty:* 8.5

*Price:* \$35

"Hey, Rodent Rooter!" That's your call to spring into action. Your job is to lay new pipe through notorious Mouse Alley. To protect yourself from the overgrown mice that live there, you'll have two mousetraps and two timid cats.

The mousetraps will hold the

mice for a few seconds before they disintegrate. Use the traps cautiously: you'll only have a handful for each level of the subterranean labyrinth. Of course, a piece of pipe always makes a handy mouse-mutilator.

**Mouskeattack** can be controlled by keyboard or joystick.

## Mr. Cool

*Sierra On-Line*

<i>System Requirements:</i>	16K	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	7.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	9.0	<i>Price:</i>	\$35

### How cool is Mr. Cool?

Cool enough to freeze a comet, or evaporate a hot springs. And he doesn't even carry a ghetto blaster.

Imagine you're Mr. Cool, and you're standing on a hot plate. Care to leap into a nice, warm geyser? How about lapping on a fireball as it blazes overhead? What did you expect — air conditioning?

As the volatile Mr. Cool, you've got to leap around on a pyramid of hot plates, eluding comets and staying out of hot water.

Give this game to your youngest computer user. It's a beginner's challenge with a cute twist. The graphics won't win any awards for imaginative design concepts, but at least the action is easy to follow.

## Necromancer

*Synapse*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	9.0
<i>Program Depth &amp; Detail:</i>	9.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	9.0
<i>Originality:</i>	9.0	<i>Price:</i>	\$35

Imagine yourself a great and mighty wizard with power over all living things. You utilize this power to free the land from all evil, for instance, from the grasp of the malevolent ruling wizard Tetragorn. With his vast army of half sprites, hammerfists, and dreaded legions of the arachnid he rules supreme. The only power strong enough to overcome this

vile sorcerer is yours.

You are Illumnar, the mighty protector of all life. Your ancient spells and enchantments bring life to the faithful forest. These trees become your fighting force as you attempt to topple the ruthless Tetragorn.

You face three major challenges. Your first objective is to create and harvest your army of

trees. This little chore involves fending off a plague of goblins and spiders sent to raze the forest (no doubt leftovers from the James Watt administration). The more trees you bring to life the faster the spiders attack. These rude arachnids not only lack proper table manners, they also have the power to zap your magical spells. You can't afford to deplete any of your mystical tricks even at this early stage; with less than full complement, your next challenges will be all the more formidable.

Which brings us to the not-so-savory question of the poison spider larvae. All you have to do to destroy the webs that cradle

these tasty little octopeds is plant a tree or two. Let 'em grow until they're heavy enough to crash through the earth into the vaults where the baby spiders are hatching.

You'll have to wander through all five vaults to reach the lair of the evil one himself. Your final challenge will require all the mystical powers at your disposal, or else a good nose plug. You see, to banish the bad guy, you'll have to tippy toe across the corpses of all those who've passed this way before.

Ah, but pass this crucial test, and you save the realm from a fate worse than Nutrasweet.

## Night Mission Pinball

*Sublogic Communications*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$35

**Night Mission Pinball**, as its name implies, is a highly vivid pinball simulation based on a World War II bombing mission. It's not a combat simulation, but an intricate portrayal of a standard pinball machine, complete with bumpers, flippers, rollovers, and spinners. All the effects can

be pre-set to any level of difficulty, or simply to vary the motion. For instance, you can change the spinner "friction" or increase flipper speed to vary the impact on the shooting pinballs.

The selectable degrees of challenge range from "Easy" to "High Speed," with two ultra-

fast modes for the truly competent. Non-enthusiasts of the conventional nickle-eater will fail

to appreciate the many nuances and subtleties of this finely crafted program.

## **Oil's Well**

*Sierra On-Line*

*System Requirements:* 16K; joystick  
*Program Depth & Detail:* 7.5  
*Support Availability:* 8.0  
*Originality:* 7.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$25

During those few, frantic months when Pac Man was the rage and the corner grocery store was the stage, the granddaddy of dot-eat-dot action games was unavailable for personal computers. As a result, a horde of lookalikes with variegated themes poured onto the market. **Oil's Well** is one of them.

It's every bit as entertaining — and slightly more inventive. At

least, it follows a timely theme that marginally qualifies as "social study." In this standard gobbling gremlin game, your oil-eating alter ego is chased around in a maze by animated sludge piles. The object is to dredge up points by drilling as many droplets as you can.

It's a humorously illustrated alternative to old Yellow Mouth.

## **Old Ironsides**

*Xerox Education Programs*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 7.0  
*Support Availability:* 8.0  
*Originality:* 7.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.0  
*Difficulty:* 7.5  
*Price:* \$34

This is a nicely produced combat game in a lavish package. The program pits two Men-o-War

against each other on the high seas. Ostensibly, each is influenced by a varied set of factors,

including rudder control, wind direction, and something to do with sails. As usually happens when I sit down at games of such intricacy of detail, I consistently maneuvered my ship either directly into my opponent's line of fire, or off in some out-of-control tangent until it vanished completely from the screen.

No doubt there's some way to retrieve the ship once it plunges out of view, but I wasn't able to discover how. Part of the problem, you see, is that whenever your opponent's cannon fire rips through one of your sails, your ship no longer responds to your rudder controls.

No doubt grand masters of the

action game will find it absurdly simple to whip the ship around at will, aim a fusilade of cannon fire, and ram the opposing Man-o-War for boarding.

This program offers excellent realism in navigational response, but undersized graphics that make the action unreasonably hard to decipher. 90% of the screen is devoted to ocean — far more maneuvering room than is really required, considering that the tiny vessels operate at about Warp .00001 (roughly comparable to "dink dink dink.").

This program is a little like Galactic Attack in water, except the Kzenta starships are harder targets.

## On Court Tennis

*Gamestar*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 8.5

*Video Design & Clarity:* 9.5  
*Documentation:* 8.5  
*Difficulty:* 8.0  
*Price:* \$30

Peering nervously over the net, you can make out the smug silhouette of your opponent, a millionaire superstar of the tennis circuit. Drawing a deep breath, you grasp your racquet combatively and loft the ball overhead. Striking savagely as you serve, you can feel the deadly precision in your bones: it's an ace, and you know it before the

ball touches ground.

Three dimensional perspective, competent graphics, and subtle attention to realistic detail make **On Court Tennis** one of the most intriguing video action games introduced this year. This elegant simulation lets you assume the role of your favorite tennis superstar to battle against the computer; your opponent can

play like a circuit pro, a country club trainer, or an everyday buffoon. You also have the option of simulating playing conditions based on an asphalt, grass, or clay court.

The outcome of each service and volley is dependent on your adeptness in controlling the "racquet." The display gives you a player's perview, looking over the net at your opponent at the far

end of the court. Hence, your computer reflexes have to be as good as your tennis prowess, as you swipe frantically at the ball as it bounds over the net looming larger in perspective.

**On Court Tennis** is a fine simulation with good production values that will be appreciated equally by racquet buffs and arm-chair video champs.

## One on One with Larry Bird and Dr. J

*Electronic Arts*

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 9.0  
*Support Availability:* 8.0  
*Originality:* 7.5

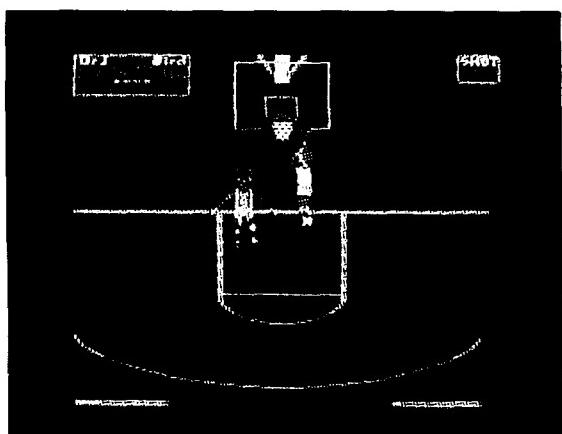
This meticulously designed basketball simulation is based on the actual playing styles and strategies of the two superstars portrayed in the title. As in life, the animated Dr. J soars gliderlike

*Video Design & Clarity:* 7.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$40

from extraordinary distances, shoots with either hand, and makes impossible shots with just a flick of his wrist. Realistically, the simulated Larry Bird whirls and turns on his opponent, leaps high above the court, and sinks long jumpers with uncanny accuracy.

One can play against the computer, or (ideally) two players line up against each other. You can select the level of challenge before the tip: parking lot, varsity high school, college, or pro. The higher the level, the quicker the moves and the better the officiating.

The joystick controls your player. If you're Larry Bird,



you'll hit a high percentage of outside jump shots. But if you're Dr. J, you're better off driving the lane. Shooting quickness is important: the faster joystick button makes or blocks the shot and secures the rebound.

The attention to detail and the lightning-quick pace are captivating, but the graphic design misses its mark. Such an ambitious challenge with so illustrious a cast certainly deserves better production values.

## O'Riley's Mine

Datasoft

*System Requirements:* 16K, disk or cassette; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$30

Well, sure an' Begoran, O'Riley me lad, if you're not a fine miner, a runnin' around in your shaft and a gatherin' up all the buried treasures there. But best ye'd be keerful, now, lest the incomin' waters deluge the shaft an' drown ye like a cat.

Yew'd also be wise, O'Riley boy, to avoid the hungry river monsters who'd jest as soon have ye' for dinner as' see you scamperin' around like a leprechaun in the underground. Yer best defense, lad, is yer satchel of dynamite: toss em a few sticks and hope that the debris slows em down. 'Course, sooner or later, the rushin' river is bound

to wash out the shaft agin.

Now, if yer a particular good shot, O'Riley me friend, an' happen to time your explosions to the second — why, you may find yerself ablowin' up all the beasties at once and ascorin' more points to boot.

There're quite a few levels of difficulty, you know; at first, yew'll find only a few o' the monstrous concoctions, but there'll only be more jest as soon as th' computer starts athinkin' you're beginnin' to get th' hang o' this game.

Hope you've got a joystick t' enjoy this challenge.

## Pacific Coast Highway

Datasoft

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 7.0  
*Support Availability:* 8.0  
*Originality:* 7.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$25

According to psychologists, the reason "Frogger" was so popular in the arcade was a macabre cynicism among young people about the highly competitive, rapidly paced environment in which we live today; in that frenetic action game, a poor frog struggles pitifully to cross a roaring freeway, inevitably ending up as a green splat on the asphalt.

Here's an equally frivolous treatment of modern-day futility, but designed for the Type B personality. In this blatant ripoff,

the player's alter ego is a turtle making his way languidly through a traffic jam to the opposite side of the Pacific Coast Highway. Your way will be hindered by conveyor belts designed to whisk tarrying turtles horizontally across the screen. If you survive, you'll have to pounce across a series of passing boats to keep from getting wet.

If you have a cynical playmate, both of you can race separate turtles through the obstacle course.

## Picnic Paranoia

Synapse

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$35

Everyone knows where there's a picnic there are ants. It's a fact of life — as inexorable as death and you-know-what. Listen closely, and you'll hear them marching in tight parade formation, goose stepping straight for your food.

Now, George is trying to enjoy

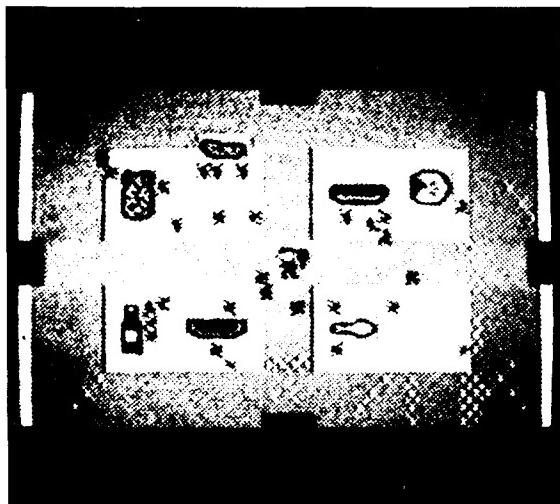
his Sunday outing, but it seems a conspiracy of spiders, ants, and wasps are out to ruin his day. When the spiders aren't attacking him outright, they're spinning webs all around him. But it's the wasps that are especially verminous: one sting, and poor

George is sent flying to the center of the screen, paralyzed for five seconds. While your alter ego hangs around in anaphylactic shock, the ants make off with the picnic.

Your only defense is a flimsy fly swatter. Once the marching ants have made it halfway across the picnic table, forget it. If enough of them make it, they'll proceed to push all the food off the table, then completely off the screen. The only way to save your gastronomical gathering is to swat wildly in all directions.

Each round lasts approximately ninety seconds, growing increasingly difficult as you progress. The game is over when the ants have made off with all the food.

This is a perfect gift for that nature-abhorring cityophile too timorous of the "icky things" outdoors to enjoy a pastoral repast.



## Pie Man

*Penguin*

**System Requirements:** 48K, disk; 16K, cassette  
**Program Depth & Detail:** 8.0  
**Support Availability:** 8.0  
**Originality:** 8.5

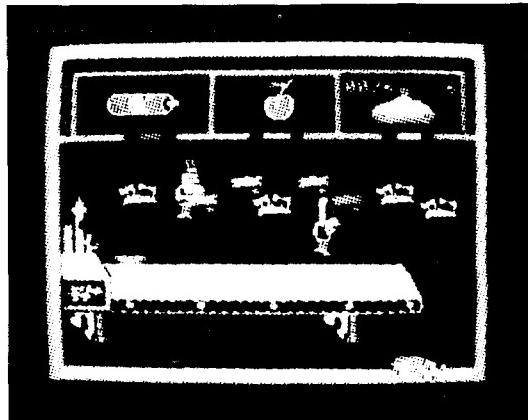
**Video Design & Clarity:** 8.5  
**Documentation:** 7.5  
**Difficulty:** 7.5  
**Price:** \$20

No, this game isn't about a pie-shaped happy face that scampers around in a labyrinth in quest of vitamin pills. It's just what the title implies: the old, accelerating conveyor gag. You're the pie man, and it's your job to plop whip cream and cherries on every pie that comes sliding out of the

door onto the conveyor belt.

You get a whipped cream squirter and a cherry to handle the job. Now if only you didn't have to race up to the top of the screen, fetch the squirter, spray the whipped cream, then dash back and get a cherry...

Of course, there's an amplitude



of obstacles between you and the supply cabinet. Slip on a grease spot, or bump into the brandy-sipping baker and you're in trouble. Lose seven pies and you're unemployed.

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## Pitstop

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Epyx

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.5  
*Documentation:* 7.5  
*Difficulty:* 8.5  
*Price:* \$40

This auto race simulation follows your funny car along a tortuous (and treacherous) track, monitoring your fuel status and the condition of your tire tread. You begin by selecting your course from six different track designs. The idea is not only to negotiate the track at breakneck

speed, but also to keep your pitstop to a minimum. Your stick figure assistants will have to roll out their jack, lift the car, change tires, and refuel the tank as quickly as your joystick can manipulate them.

For maximum satisfaction, compete against a playmate.

## Pooyan

Datasoft

*System Requirements:* 32K, disk and cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 7.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$30

Imagine battling a bunch of vicious hungry wolves floating through a forest in hot air balloons. If this seems a little bizarre remember the reason — you must protect your brood of helpless piglets roaming the forest unguarded. Your weapon is a bow and arrow and your mode of transportation, a tram. As these wacky wafting wolves float around hurling objects at you, you try to

shoot their balloons with your bow and arrow or distract them with meat while you catch your breath. Watch out though, because they are capable of plotting against you — and are constantly trying to push a giant rock over a cliff — right on your head!

**Pooyan** is recommended for ages ten to adult. It features high-resolution graphics and offers two different screen scenarios.

## Popeye

Parker Brothers

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 9.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$45

This game's faithfulness to the comic book mythology and occasionally hilarious action scenarios give it high marks in originality and interest. Designed for younger computer users, it's a good game for Family Night in the rainy season of the suburbs.

In this engaging melodrama involving America's most famous love triangle, Popeye must suc-

cessfully catch twenty-four heart-shaped hankies, sixteen love letters, and eighteen desperation notes all unleashed by his heart throb Olive Oyl. There are three scenarios in which our erstwhile sailor man must fend off his arch rival, Brutus, as well as other recognizable villains — including the cranky sea hag and an unruly vulture.

As (and if) you manage to make it from one scene to the next, the level of difficulty will increase accordingly. In all, the game is a decent challenge that is very representative of the climb-

ing, leaping, eluding genre. Quaint graphic qualities and a tongue-in-cheek approach contribute to a thoroughly entertaining family game.

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## Preppie

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*Adventure International*

*System Requirements:* 32K, disk; 16K, cassette

*Program Depth & Detail:* 8.5

*Support Availability:* 8.5

*Originality:* 8.5

*Video Design & Clarity:* 8.0

*Documentation:* 8.0

*Difficulty:* 8.0

*Price:* \$30

Out on the Nasty Nine you'll find Wadsworth Overcash, a premium preppie dressed in Izod fashions. You see, old bean, he's been banished to the golf course for losing the annual freshman oyster eating contest. Really. And he's to stay there collecting stray golfballs until the funny little alligator on his polo shirt turns blue.

The caretakers at the country club aren't especially fond of preppies, you know. In fact, they're out to make poor Wadsworth's life simply miserable. Really.

In this cynical adaptation of the popular leaping game, "Froger," you must maneuver your

preppie across the green, while deftly dodging speeding golfcarts and maniacal maintenance men. If he makes it to the water trap, he'll have to leap lithely from passing canoes to floating logs to reach the opposite bank. There, he'll find the majority of the stray balls.

Ah, but don't give up yet, old chap, you're still obligated to return to the course before time expires. The faster you grab up the balls, the more points you'll accumulate.

Splendid graphics and a musical score in two-part harmony supplement your vicarious thrill as the profligate and pitiable preppie.

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## Preppie II

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*Atari*

*System Requirements:* 32K, disk; 16K, cassette  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$35

We're assuming here that the persistent preppie, Wadsworth Overcash III, has survived his run-in with the dreaded groundskeeper in the Frogger ripoff that preceded this sequel. As a lowly pledge in the Delta Skelter Omega fraternity, Overcash is currently suffering through a week of pledge hazing. Now, a practical joke is fine, but poor Wadsworth has been abandoned in a deserted building constructed of mazes to face his most dreaded enemies.

You must maneuver your pitiable chap through each of the three labyrinthine corridors. As he makes his way through each maze, he paints a pink stripe on the floor so he can find his way out. The first corridor leads past several revolving doors. Behind

them, Wadsworth may find an enlightening egress — or merely a giant frog. Now the frogs, along with the killer golfcarts and lawnmowers of previous adventures, are all out to get you.

But fear not, old bean, for within your clutches resides the ultimate preppie weapon: the magical cloak button. One click of the button and your vicarious profligate becomes instantly invisible. Of course, the effect is only temporary, but it should buy you a little time.

When you've finished painting all three floors pink, you can move on to another level of play. With five levels and fifteen mazes, you'll need a lot of pink. Really.

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## Protector

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*HesWare*

*System Requirements:* 32K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 9.0  
*Price:* \$40

Your mission is to rescue the citizens of a city from the attacking Fraxullan Slimehords. You must transport them all to the City of New Hope, on the other side of the volcano. Take care not to drop anyone into the molten lava below. From there you must take them to the safety of the Verdann Fortress.

To transport these doomed citizens you must pass over them and hook the ones you wish to lift to safety. All the people you rescue must be registered at the city before the barrier to the fortress will be opened. You can retrieve those citizens you accidentally dropped into the

volcano, but only if you're a joystick pro with lightning reflexes.

More than likely, you'll drop a few frenzied civilians one on top of the other, crushing the life from them as they writhe in desperation. Assuming that with experience, you manage to herd all the survivors to the new city, don't think the party's over. The volcano is programmed to erupt before the registration drive is complete — spewing hot death and lava across the monitor screen.

This game is designed for one player and is manipulated by joystick only.

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## Pushky

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Atari

*System Requirements:* 48K, disk; 2 joysticks  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$23

When you boot this disk, you find yourself lost in some remote location in time and space — an unworldly dimension, a land filled only with variegated clouds and a population of curious little creatures called pushkies. What's unusual about those blithe spirits is their uncanny resemblance to miniature joystick controllers. The favorite (and only) pastime of the pushkies is pushing clouds and

fellow pushkies around all day.

In this two-player game, you earn points by making your pushky push more clouds around than your opponent's. You move clouds by firing missiles at them. An accurate aim will disintegrate the cloud and materialize your pushky in its place. Hit an opponent's pushky, and you'll annihilate it, too.

You earn spare pushkies by

moving quantities of clouds. To win this meteorlogical battle you'll have to successfully eliminate all of your opponent's creatures — or be the first one to reach the V at the end of the cloud indicator bar. As you probably guessed the V stands for victory.

All this is merely a warmup for

a more challenging level of play, "Crazy Pushky." At this level, the clouds gain self-consciousness and learn to disappear on their own by changing their color to blend in with the background. All the pushkies in the game also have this chameleon power.

In either level, two joysticks are required to play.

## **Q\*Bert**

*Parker Brothers*

**System Requirements:** 32K, joystick  
**Program Depth & Detail:** 8.0  
**Support Availability:** 8.0  
**Originality:** 8.0

**Video Design & Clarity:** 8.0  
**Documentation:** 7.5  
**Difficulty:** 7.5  
**Price:** \$30

**Q\*Bert** is a flakey little fellow with frenetic, floppy feet who spends his time roaming a chameleon-like pyramid of twenty-eight squares. It's your responsibility to land him on every square at least once. Each time he touches down, the square where he lights metamorphises into a new color. The object, therefore, is to completely transmute the entire pyramid.

Should you miscalculate — alas, the poor little guy plunges over the opposite side to his death. Unless, of course, he's lucky enough to land on one of two disks suspended on the sides of the building. These are like elevators and take him back to the top square of the pyramid.

**Q\*Bert** does have a few enemies of his own. Coily, who hops around on springs, would just as soon shove the lithe little leaper off the pyramid altogether. This unsavory spring chicken is hatched from a bouncing purple ball, one of several colored balls that influence play. A green ball hangs out at the top level and freezes all the characters if you touch it. Then there's Sam, an ornery little rascal who runs around changing the squares back to their original color.

With each level of this game, **Q\*Bert** faces greater quantities of both obstacles and enemies. He also has to jump on each square twice to get it to change colors. In higher levels, if you step on a

square too many times it will change to an intermediate color you must subsequently change back again.

If you're fond of the arcade version, you'll find controlling your character with a joystick to be a little cumbersome. The reac-

tion time is slow, and you'll quickly discover that you must manipulate the joystick a full forty-five degrees to move on a diagonal. The graphics are mere ghosts of the original.

Still, this is the one and only.

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## Quasimodo

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*Synapse*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 7.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$40

Call this scampering, climbing, swinging game "Apple Cider Spider in Notre Dame Cathedral." Your leggy video entity must race along tenuous ledges, elude menacing foes, swing across the screen on a hanging thread, and climb a succession of ladders. In this game, of course, you're the notorious hunchback Quasimodo accused of purloining the castle jewels. Actually, it was supposed to have been a gypsy maiden, but apparently this version is earmarked for youngsters too innocent to be polluted by such notions. In fact, your Quasimodo alter ego is no hunchback at all in this zippy action scenario; instead, you're a pecan-pated pajama boy looking like a refugee

from an E.T. day care center.

In the process of proving your innocence, you must elude a handful of palace guards, and climb up a stilted ladder to the mythical cathedral bells. There, a platform has been conveniently erected so you can swing from bell to bell across the screen to a second ladder. Your perils include archers, bats, and a magical wizard (an apparent Pablum version of the evil Bishop of Notre Dame).

A silly soundtrack that grates on the nerves, embarrassingly amateurish graphics, and an abysmal adaptation of classical literature may not prevent you from getting into the swing of this fast-paced game.

## Quarxon

APX

*System Requirements:* 16K, cassette; 24K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 7.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$30

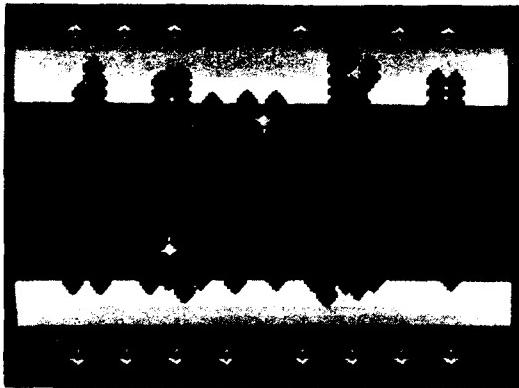
Here you are immersed in the middle of your bold discovery mission, having finally located a friendly colony of droids, when all of a sudden your scanner picks up signs of enemy movement somewhere in the Quarxon galaxy. Reporting your conclusions to headquarters, you're ordered to defend the droids against impending invasion. But you've only got one starfighter...

The aliens descend in dense hordes, literally filling your monitor screen with a pulsating mosaic. The trick here is to fire your laser through random openings in their defense lines. Of course, should your own ship get zapped by incoming fire, you'll invariably be crushed by the onslaught.

The battle for the colony concludes as soon as either side has completely demolished the other.

This game is designed for one

to two players, or you can watch the computer battle it out against itself. There are three levels of difficulty to choose from. You can increase or decrease the number of enemy ships, and vary the degree of thickness of the enemy's defense blockade. If you choose to decrease the number of enemy ships, the battle will be more difficult to win. The number of ships present determines the number of lives you have to expend.



## Quest for Tires

Sierra On-Line

System Requirements:	16K	Video Design & Clarity:	10
Program Depth & Detail:	9.0	Documentation:	9.0
Support Availability:	8.0	Difficulty:	8.5
Originality:	9.5	Price:	\$35

You're gliding along on your wheel with the breeze tugging at your locks, when suddenly a low hanging tree limb whips into view. Ducking that, you fly out over a cliff, barely leaping in time to clear the opposite side. No sooner does your wheel touch ground than a stream looms up on the horizon. Fortunately, there's a school of tortoises lounging about in the water. But as you deftly maneuver along their shells, there's still the one peril you forgot to consider: the Fat Broad.

In **Quest for Tires**, you're the protagonist in the Johnny Hart cartoon, "B.C.", on a trans-prehistoric trek in pursuit of the Cute Chick. The dangers include

a miscellany of earth formations, dinosaurs, and of course, the dreaded Fat Broad, who wishes you no auspices.

The animation is excellent — at the very pinnacle of design competency. The graphic content makes ample use of color to augment its lucid illustration. The action sequences, from changing facial expressions to the ominous club of the portly Fat Broad, are nothing short of hilarious. This game is far from being the most gripping hand-eye challenge on the market, but the comic motif and engaging graphics are captivating enough in themselves.

**Quest for Tires** is a masterpiece in its own right and, with any luck, only the first in a series.

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## Rainbow Walker

Synapse

System Requirements:	48K, disk; joystick
Program Depth & Detail:	8.0
Support Availability:	8.0
Originality:	7.5

Video Design & Clarity:	8.0
Documentation:	7.5
Difficulty:	7.5
Price:	\$35

How is this colorful, leaping, eluding game different from the arcade phenomenon Q\*Bert? Well... it's mostly the front-end spiel, and here it is:

In a far away land some despicable creature has burgled the rainbow and made off with all the colors. Naturally, darkness and sorrow settled across the land in short order. Even the little cherubs wiped the silly grins from their faces. Got it so far?

Now, it seems that this here great wizard of the royal court was reading in his magical book when he ran across a spell for magical musical shoes. When the king was informed of this wonderful news, he called forth

his bravest subject. Sir Cedrick would have the honor of restoring the colors to the rainbow. Cedrick put on the enchanted shoes and started on his journey. He found the rainbow a dark and gloomy sight, inhabited by whirling dervishes, gruebirds, and other nasty beasties.

So now you have it. You're Sir Cedrick's joystick manipulator, and it's up to you to maneuver the brave soul up, around, and down the rainbow. Where monsters walk the rainbow turns dark. Your task is to beat them to each section and bump them off.

The action is quick, but not blinding; this is a dazzling reflex builder for the younger set.

## Repton

*Sirius*

**System Requirements:** 48K, disk; joystick  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.0  
**Originality:** 8.0

**Video Design & Clarity:** 8.5  
**Documentation:** 8.0  
**Difficulty:** 8.5  
**Price:** \$40

The colony Repton is being invaded by alien Quarriors. You see, the insidious invaders are out to purloin valued energy sources from the colony's lifegiving power grid, hoping to use the ill-gotten power supply to construct their own base station from whence to wreak incalculable havoc.

Only you can stop them from

completing their base and destroying the entire colony.

So here you are, gripping the controls of your state-of-the-art Starfighter, armed nuclear bombs, a laser gun, a force field, and an advanced radar system.

You'll be under constant fire from both Single Saucers and Nova Cruisers as you set out on the endless sea of stars. Be on

guard, or you'll find yourself ramming uncontrollably into some stray satellite or blasted from the heavens by an adept

### Dynebeam Shooter.

This action game is designed for one player and is manipulated by joystick.

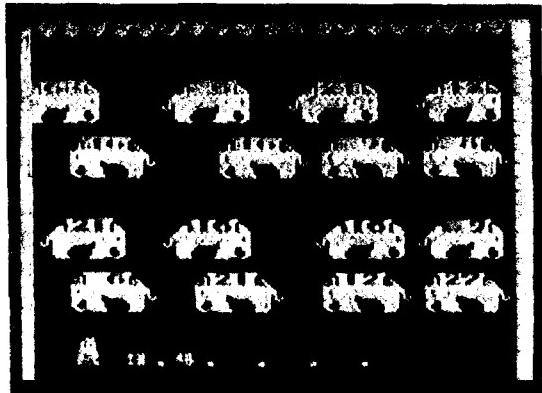
## Ringmaster

APX

*System Requirements:* 16K, disk or cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$25

Now's your chance to be the ringmaster, though there's no guaranteeing you'll find orchestrating a three-ring circus all that it's cracked up to be. In the first place, you'll have a ruefully rambunctious monkey to control; you'll have to use the joystick to help him deftly leap over the backs of performing elephants and camels.



He's likely to leap all over the screen, but it's your job to make sure he lands on a dromodile or pachyderm wearing the right number. Of course, you've first got to figure out which number is safe: it's got to be a multiple of the number on which the monkey was standing when he initiated his pounce. When the music ends, he'd better be standing on a safe number... or you lose your job and the game to boot.

This arithmetic rendition of "musical chairs" substitutes circus animals for furniture, with seven optional difficulty levels. The higher the difficulty level, the faster the parade. If you forget your multiplication tables, you can ask the computer for help.

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## River Rescue

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*Thorn EMI*

**System Requirements:** 32K, cartridge; joystick  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.5  
**Originality:** 8.5

**Video Design & Clarity:** 8.0  
**Documentation:** 8.0  
**Difficulty:** 8.5  
**Price:** \$40

Three explorers are lost in the Amazon jungle. As the Captain of a mighty river vessel you set out to rescue them (for your usual fee). Navigating this wild river can prove treacherous: time is your enemy, and speed is everything. Behind you, a hungry cadre of competitors is waiting for you to stumble.

Your cannon is a hearty remedy for any obstacles that cross your path. To manipulate it, you'll need fast reflexes and keen anticipation. Finding a stranded explorer, you'll have to dock, effect the rescue, then return the hapless hostages to safety.

If you happen to hit an obstacle or run aground — well, you'll explode and lose a life. On the other hand, the computer rewards you for eluding obstacles. You also acquire points for destroying impediments, maintaining speed, and rescuing a stranded archeologist. Complete the course, and you'll receive a final bonus to augment your score.

This game is designed for one to two players and can be controlled with a keyboard or joystick. There are four rivers to navigate and an extended game option.

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## Rosen's Brigade

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*Gentry*

**System Requirements:** 16K, disk or cassette; joystick  
**Program Depth & Detail:** 8.0  
**Support Availability:** 8.0  
**Originality:** 8.0

**Video Design & Clarity:** 9.0  
**Documentation:** 8.0  
**Difficulty:** 8.0  
**Price:** \$17

You and your squadron of ace pilots are on a secret bombing mission, when from out of nowhere the enemy strikes. Taken

by surprise, all of your fellow pilots are downed. The sole survivor, you watch hopelessly, as your men parachute into the

hands of the enemy.

Now it's up to you to rescue your captive men. Flying behind enemy lines, you'll face a furious onslaught of bullets, tanks, and explosions. Your most potent weapons are lightning fast aim and instant reflexes.

Your score depends on the

number of enemies destroyed and the number of pilots you manage to rescue. This game is designed for one player and is manipulated by joystick. You can choose from ten levels of difficulty, with the higher levels increasing the numbers of both enemy attackers and low lying obstacles.

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## Salmon Run

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Atari

*System Requirements:* 16K, cassette; 24K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 9.0  
*Originality:* 8.0

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$25 cassette and disk

You're Sam the salmon on your amazing yearly run upstream to your spawning grounds and mate, Samantha. In a test of survival against waterfalls, bears, fishermen, and seagulls, only determination and quick-witted strategy will get you there before your life span is over.

Graphically illustrated with a vertical river that scrolls realistically "downscreen," Sam must make his way past bears, birds, fishermen on banks, and waterfalls. The visual effects are nothing short of charming. Engaging sound effects include the growl of bears, the caw of birds, and the resurgent gurgle of waterfalls.

One to four players taking turns can try to overcome predators and waterfalls which appear in ever-increasing frequency the longer you survive. If you miscalculate when you jump waterfalls or are caught by a predator, you start again at the bottom of the river. If you choose to hide out against an impending peril, you'd better weigh the value of your safety against your constantly decreasing life span.

Make it upstream to Samantha before you die, and you'll be rewarded with a baby salmon (salmonette?). Your lifespan, game level, and score are displayed at the top of the screen. The computer awards a point for

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every linear foot that Sam manages to struggle upstream; alas, you lose points if you're

forced backriver to the starting point. Ten points are gained for every successful waterfall jump.

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## Scram

Atari

*System Requirements:* 16K, cassette; joystick  
*Program Depth & Detail:* 9.0  
*Support Availability:* 9.0  
*Originality:* 9.0

*Video Design & Clarity:* 9.5  
*Documentation:* 9.5  
*Difficulty:* 8.5  
*Price:* \$25

So you'd like to be the chief operating engineer of a nuclear power plant? So you think Three Mile Island is a condominium project in south New Jersey? Here's an interactive learning game that should add a glow to your cheek.

**Scram** is a simulated nuclear plant, complete with animated fluid motion in three main cooling units. Your instrument panel monitors the temperature for various points in the system. You control all of the valves, pumps and reactor control rods with your joystick. As you manipulate the valves and pumps, you'll see the effect on temperature on the monitor screen.

If you're in a particularly nasty mood, you can always melt down

the entire reactor core.

Once you garner familiarity with the functions of all the pumps and valves, you can test your skill in keeping the plant on line in the game mode. You have nine skill levels to choose from; the higher the level, the higher the frequency of earthquakes that rattle your plant. With each quake a different sector of the plant is damaged. You'll have to send in cleanup crews, but after all, your manpower is limited.

This program has good production values, including excellent graphics and decent response. The documentation is both a lucid program guide and a nuclear power tutorial.

If you want to save energy, you can always glow in the dark.

## Sea Bandit

*Gentry*

*System Requirements:* 16K, disk or cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 7.0  
*Documentation:* 7.5  
*Difficulty:* 8.5  
*Price:* \$20

You supply the imagination (and, hopefully, plenty of it) in this reasonably challenging but crudely designed tactical game. Ostensibly, you're a tiny little explorer commanding a minuscule ocean probe. The object is to lower your probe safely to the bottom of the sea and secure the sunken treasure that awaits there.

Your perils are symbolized by

simple icons drafted in glowing, phosphorescent colors, making it nearly as difficult to make them out as to contend with them.

The game offers twelve selectable difficulty levels. Despite its visual shortcomings, the game maintains a quick pace and requires adept reflexes. It's a suitable hand-eye challenge for the intermediate aficionado.

## Sea Dragon

*Adventure International*

*System Requirements:* 16K, disk or cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$35

**Sea Dragon** poses you as the commander of a nuclear powered submarine navigating your way around and through underwater mountains, clandestine passageways and explosive mines. Your mission is to seek and destroy an automated nuclear reactor located deep within the ocean.

Of course, you'll encounter a miscellany of obstacles on your journey, or there wouldn't be a

pretext for a game here. Depth charges will be dropped from the surface; unnamed enemies will attack unexpectedly; explosive stalactites will break loose from cave roofs (geology is not the author's strong suit); and your air supply will run low.

Though your fire power is unlimited, your oxygen supply is limited. You'll do well to keep an eye on the oxygen gauge and sur-

face for air at the earliest opportunity. Overlook this minor detail, and the game will end quickly.

When you finally make it through the obstacle course, you'll find the nuclear reactor. The target is protected by strategically placed lasers. To make matters more difficult, random radioactive debris will come floating up from the ocean floor. In this game, there's no "safe" level of radiation: fry, and you die. You'll find quickly that one

or two blasts will hardly suffice to break down the laser screen. It'll take repeated attempts to demolish the shields before you finally manage to break through — assuming you've managed to successfully elude the radioactive garbage.

Destroy the reactor, and the game starts anew.

The game can be played by one or two; a joystick is required. Younger children will enjoy this rudimentary challenge.

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## 747 Landing Simulator

APX

**System Requirements:** 24K, cassette; 32K, disk; joystick

**Program Depth & Detail:** 8.0

**Support Availability:** 8.0

**Originality:** 8.0

**Video Design & Clarity:** 7.5

**Documentation:** 7.5

**Difficulty:** 8.5

**Price:** \$25

The shimmering lights of the runway grow brighter as you approach, and the wind whistles eerily in your ears. You glance impulsively at your instruments as the whine of your engines begins to fade. The altitude drops to zero as you plunge toward the asphalt.

Complete with sound effects, this vivid simulator puts you in the pilot's seat of a 747 jet airliner. You're twenty miles out, traveling at 600 miles per hour at an altitude of 5,000 feet. To avoid collision with a plane flying

in a different corridor, you must follow a three degree slope in your approach.

You've got to control the pitch and correct the heading, so the plane lands parallel and on the runway.

Decent, three-dimensional graphics and responsive animation give this program added realism. Your instrumentation and visual perspective are true to life. The object of the game is to use as little time and fuel to land as possible — assuming, of course, you do manage to land.

You can select from three levels of difficulty and opt for instrument-assisted landing or the

always entertaining seat-of-the-pants flying mode.

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## Serpentine

*Broderbund*

System Requirements:	48K, disk	Video Design & Clarity:	8.0
Program Depth & Detail:	7.0	Documentation:	7.5
Support Availability:	8.0	Difficulty:	8.5
Originality:	8.5	Price:	\$35

Here's a slithery cross between the "Pac-Man" arcade game and the timeworn "Slinky" toy. These serpents are more caterpillar than cobra, writhing their way through a random maze with voracious, cannibalistic appetites.

In **Serpentine**, you're a split personality in the form of three blue snakes, the good guys. Your hated enemies are the orange snakes, who from time to time turn green. Naturally, both kinds feed on the other.

You start the game in a run-of-the-mill maze. In the course of events, orange serpents will slither

out of the lower left corner, and one of your blue selves will lay an egg or two. If you successfully wolf down all the antagonistic serpents, your eggs will hatch into offspring and the family lives happily ever etc. If, on the other hand, the orange snakes make serpent Cordon Bleu out of your three alter egos, using your future progeny in the Hollandaise, guess what: you lose.

**Serpentine** is an interesting twist on a well worn theme. Its graphics, sad to say, fail to live up to its name.

## Shootout at the OK Galaxy

*Avalon Hill*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	9.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.5
<i>Support Availability:</i>	8.5	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$25

Like an air flight simulator, **Shootout** puts you in the cockpit of a fast, sleek star raider in a furious dog fight with a horde of alien fighter craft. Demanding and tense, this game is one of the best "Star Trek" variations on the market, borrowing liberally from the popular BASIC game almost every programmer alive has played at least once.

In the original version, a random number of enemy ships invade Federation space, and the player is tasked with hunting and

destroying them by a designated stardate.

In this fast-paced, vicarious target shoot, the monitor is your viewscreen into space, and your phaser blasts streak off ahead of you as you fire.

An on-screen panel gives you your location in space, heading, azimuth, and status of your energy, shields and sensors. Nice graphics and fast motion in real time make this one of the premier galactic target games.

## Sky Blazer

*Broderbund*

<i>System Requirements:</i>	48K, disk; joystick	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	7.5	<i>Difficulty:</i>	8.0
<i>Originality:</i>	8.0	<i>Price:</i>	\$30

The galaxy is in the hands of the evil and repressive Bungeling Empire. Only a daring assault on the Empire Headquarters will save the few men and women of good will remaining. You are the legendary "Sky Blazer" — and

your mission is to destroy the evil empire!

Flying a vintage World War III jet, you must outmaneuver hazardous obstacles such as radar stations, supersonic tanks, ICBM installations, and explosive sky-

mines. You control your altitude as you move left to right across the screen, firing bombs at low altitudes and pulse cannons higher.

You are allowed three planes to carry out five missions. Each plane has three thousand gallons of fuel and thirty bombs. Refuel

in the air by catching a cargo parachute dropped periodically from a supply plane. With patience, skill, and determination you can destroy the rotten Bungeling Empire Headquarters, Sky Blaser — and let the good guys prevail!

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## Slime

### Synapse

*System Requirements:* 16K, joystick

*Program Depth & Detail:* 7.5

*Support Availability:* 8.5

*Originality:* 8.5

*Video Design & Clarity:* 7.5

*Documentation:* 8.0

*Difficulty:* 8.5

*Price:* \$45

There's apparently a class of computer user — usually boys from ten to fifteen years old — drawn magnetically to any game with a title involving things slimy, slimy, or spidery. No doubt the name of this erstwhile action premise was assigned with this demographic attribute in mind.

The computer displays a screen full of ocean, with two under-water tubes on opposite sides. Meanwhile, a volatile boat floats precariously atop the waves. You're to believe that a horde of invaders that go by the name

“Plexerians” has orchestrated a catastrophic slime storm. As you begin the game, the sky begins to rain slime and lethal bolts of lightning lash out at the waves.

Your job is to suck up the slime in your undersea absorber tubes while protecting your surface-level ship. The slime is so dense that it actually raises the level of the ocean as it plops from the sky — exposing your vulnerable ship to the lightning.

To claim victory, you must successfully combat fifty climatic slime attacks.

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## Snark Hunt

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*Atari*

**System Requirements:** 16K, cassette; 24K, disk; joystick  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.5  
**Originality:** 8.0

**Video Design & Clarity:** 8.0  
**Documentation:** 8.0  
**Difficulty:** 8.0  
**Price:** \$23

You have a very important mission: to find the snarks that are hiding in a snark box. It takes logic and patience to search the little critters out. Your only clues to the location of these wily creatures are vorpal beams that you fire into the box.

You hunt for the snarks by firing your beam into a grid. The beam's refractory path will indicate the locations of snarks. As the beam travels through the box it is either deflected by a snark, hits the snark, is absorbed, or ex-

its opposite the point of entry.

Once you think you have located all of the snarks, you mark their positions. The program then shows you the actual locations of the snarks and presents you with a final score.

This game can be played by up to eight players using only one joystick. Players can hunt down up to nine snarks; the higher the number, the more difficult the solution. You can let the computer hide the snarks, or another player can have the honor.

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## Space Invaders

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*Atari*

**System Requirements:** 16K, cartridge  
**Program Depth & Detail:** 7.5  
**Support Availability:** 8.5  
**Originality:** 8.0

**Video Design & Clarity:** 8.0  
**Documentation:** 8.0  
**Difficulty:** 8.0  
**Price:** \$35

This home version of the classic arcade game has been revamped but remains true to the original in most respects. Five rows of alien invaders are poised on the left side of the screen. As they move across the field of action, they continually fire at your

mobile laser base. Those who survive your counterassault move down one row — and a step closer to destroying you.

In this adaptation, the castles at the bottom of the screen have been removed, leaving you with not much of anything to hide

behind. You'll also find a space ship positioned at the side of the screen, another variation from the original quarter-eater.

Two players can alternate, with six levels of difficulty. Each ascending level of challenge

reduces your defenses against the unrelenting onslaught.

If you are a devoted fan of the original arcade version of this game, you may find it disappointing.

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## Space War

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APX

*System Requirements:* 16K, cartridge; 24K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.5  
*Difficulty:* 8.5  
*Price:* \$25

Fine production values and a challenging pace augment an otherwise hackneyed motif of intergalactic dogfighting and tactical maneuvering. There's nothing original about the scenario: an enemy fleet is invading the galaxy, and you're charged with outmaneuvering and destroying the intruding forces.

Your best bet is to navigate around the sun, hoping for a strategic vantage point from which to surprise an unsuspecting alien. The intruders are patiently poised for the slightest miscalculation. Let down your guard, and you can expect a fusilade of Mark II photon torpedoes. A direct hit on your rocket fighter, and it's instant oblivion.

This game is designed for one to two players and requires a joystick controller. Players can vary the effects of gravity, change the perimeters, and choose the speed of play. Score limits can also be set or you can sharpen your skills in the practice mode.

This disk is a terrific action scenario for the younger set. Imaginative design and flexible game conditions contribute to the "realism" of conflict in the twenty-fifth century. Experienced galacticians may scoff at the program's rudimentary motif and simplistic objectives. Still, if you don't yet own one of these interstellar target shoots, you might give this one serious consideration.

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## Spider Quake

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*Gentry*

**System Requirements:** 16K, disk and cassette  
**Program Depth & Detail:** 7.5  
**Support Availability:** 7.5  
**Originality:** 7.5

**Video Design & Clarity:** 8.0  
**Documentation:** 7.5  
**Difficulty:** 7.5  
**Price:** \$17

Eddie the long-legged spider is on a journey to Spider Mountain. Many hazards and perils await him as he makes his way across the countryside. Will he arrive in one piece?

Part "Frogger," part "Crisis Mountain," part "Apple Cider Spider," **Spider Quake** combines a miscellany of trendy action motifs. Your job is to help Eddie cross the highways without getting squished by the passing semis. Eddie must also survive an earthquake that rocks the Richter scale and hails boulders.

He also must make it across a raging river infested with creatures who consider spiders a gourmet delicacy. If Eddie hesitates in one spot too long, a ravenous vulture lurks overhead, ready to swoop down for a quick Eddie lunch.

Visually, **Spider Quake** is a crude concoction obviously drummed up without the aid of a skilled illustrator; but its rapid pace and hilarious onslaught of perils more than compensate for the miserly graphics.

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## The Spy Strikes Back

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*Penguin Software*

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 8.5  
**Support Availability:** 9.0  
**Originality:** 8.5

**Video Design & Clarity:** 8.5  
**Documentation:** 8.5  
**Difficulty:** 8.5  
**Price:** \$35

You were beginning to think you had pulled perpetual office duty when an urgent phone call rouses you from bed. It seems several agents have disappeared in a converted castle in the East German village of Aichenbach.

The owner of the mildewed mansion is none other than the internationally feared terrorist, the malevolent Dr. X.

Now, good old X has been threatening to detonate a nuclear bomb in a densely populated area

if the world community doesn't meet his demands. Before time runs out, you've got to penetrate the security system and discover exactly where the good doctor plans to detonate the bomb.

You begin the game on the first floor of the castle, where nine clues are scattered about in various hiding places. The giant fortress is divided into 24 guarded sections containing 16 chambers for you to skulk about. The homing device you carry tells you exactly which part of the castle you're in at any given time. Doors to each room open automatically. A room with a flashing square contains an elevator to take you up or down one floor.

When you first enter a section,

there's no visible way out, but a flashing ring will go off somewhere near. If you arrive there in time, an exit door will open.

The game is operated with simple key stroke commands. The arrow keys control horizontal movement, "A" moves you up, "Z" makes you descend. Press the spacebar and you freeze the action.

You receive an extra spy with every 2,000 points, up to five at any one time. The action is insanely fast paced, making it all the more difficult to concentrate on your objectives. Like Spy's Demise, this is a delightful action game with a mystery theme that's consistently challenging and occasionally hilarious.

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## Spy's Demise

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*Penguin Software*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 9.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

You were sitting in the lobby of a Bangkok hotel sipping your evening cocktail when you overheard two KGB agents discussing an encoded message. The message is the key to a fortune in extremely valuable computer data. But not one of the cryptologists in the Ukraine has

been able to decode it.

Now, the Soviet security is so tight that the message is kept on separate floors in the Pyongyang.

One thing's clear: whosoever can successfully assemble and solve the encryption will be able to retire nicely. And, since the spy for hire business had been a little

slow of late...what the heck.

Your research reveals that each piece of the priceless epistle is stored on tape, microfilm, and in dossiers. All you have to do is gather them all together and crack the case.

The object of this 007ish action-mystery game is to make it to the top of the embassy. The elevators are full of guards, but flashing decoder rings are worth extra points. The faster you can cross each floor, the faster your score is elevated. A timer in the right corner of the screen clicks off the seconds.

If you reach the top, part of the message appears on the screen. In the next round, you have fewer floors to ascend, but the same number of KGB agents roaming around. The level of difficulty increases each time you make it to the top, but another piece of the message is shown.

The pace is fast and the action, demanding. Looking more like Inspector Clouseau than 007, your squat alter ego scampers frenetically across each level of the perilous skyscraper, making a complete 90-degree turn when you change directions (something you'll be doing often). As if your vicarious sleuth isn't already short enough as it is, get caught beneath a descending elevator and the CIA will be DOA. If you're adept enough to make it to the second level, you'll still probably be trashed by a trenchant tovarich.

**Spy's Demise** can be played either from the keyboard, using the arrow keys, or with a joystick. The game can be paused and restarted whenever you like. It has numerous similarities to a maze pursuit game, but offers far more challenge and a mystery motif.

## Stickybear Basket Bounce

Xerox Education Products

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 6.5  
**Support Availability:** 9.0  
**Originality:** 9.0

**Video Design & Clarity:** 9.5  
**Documentation:** 9.5  
**Difficulty:** 8.5  
**Price:** \$40

With his derby hat and his taut suspenders, his subtle wink and casual gait, Stickybear is a thorough charmer. His world is a rich collage of sound and color

inhabited by an amiable menagerie of creatures, characters, and objects.

This engaging "basketball" game was designed for the family

with little toddlers — but for the whole family to play. To win, you'll have to bag a horde of falling objects before running out of baskets. Sound easy? Now try accumulating points while ducking a myriad of missiles from on high and leaping over looming obstacles along the ground. What's more, you've got to perform through 16 rounds of play, with the level of difficulty advancing each time.

The only thing really simple about **Basket Bounce** is the command format. Basic key strokes control the action: the ESC key halts the barrage of obstacles.

The left and right arrow keys move Stickybear horizontally across the screen, and the spacebar makes him jump. If you prefer an easier challenge, the program is also designed for paddle and joystick play.

The production values are superb. Not only does the animation excel, but the visual design concepts exceed anything else in this category in originality, execution, and humorous import. Even the sound effects are hilarious.

**Stickybear Basket Bounce** comes with a game poster, stickers and a punch-out character game set.

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## Star Trek

Sega

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$40

This vivid simulation of the starship Enterprise is a unique real-time galactic battle game with keen responsiveness and dazzling color graphics. It is perhaps the only "original" version of this well worn motif — i.e., the only one that is not an animated variation of a popular mainframe program of the same name. Of course, the trappings of this product are necessarily similar in concept.

The computer display gives you a three-way split screen — one providing a rundown on your ships' status, another providing a "planet's eye" view of the Enterprise streaking through space, and the third representing a viewscope for precision aiming.

This version pits you against a miscellany of enemies, including some familiar villains from both the television and motion picture series — not merely the bird-of-

prey Klingon vessels found in other Trek simulations.

Your joystick controls the usual bag of accoutrements — warp drive engines, photon torpedoes, phaser weapons, and

defensive shields. This edition offers the highest reflex challenge of any in the genre, but dilutes the tactical calculation that characterized the mainframe version.

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## Stratos

*Adventure International*

*System Requirements:* 16K, cassette; 32K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$35

Glancing skyward, you see a wave of alien aircraft sweeping across the horizon. Methodical and calculating, they unleash the most savage weaponry known to the civilized galaxy — the lethal matter ravagers.

The protective shields of the city are obliterated and several buildings have already been destroyed. With the first phase of their attack complete, the alien forces retreat back into space. But wait: a second squadron of

ships appears over the smoking skyline of the razed city. The aliens have dispatched a "mop-up" detail to finish off the helpless planet...

Your job is to defend the city from certain extinction. You quickly take control of your city's ultimate defense weapon, the Armageddon Wave. The fate of the city is in your hands.

One to two players can play this space battle.

## Swamp Chomp

*Program Design, Inc.*

*System Requirements:* 24K, disk or cassette  
*Program Depth & Detail:* 8.5  
*Support Availability:* 7.5  
*Originality:* 7.5

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$30

Booting **Swamp Chomp**, you'll find yourself deep in the swamplands of Muckedoo, trying to make it to your feeding station on the furthermost bank of the swamp. The only problem is that the water is filled with ravenous alligators and other scaly creatures. You can't stay where you are or you'll starve to death. So you venture on realizing you can't return home until you've eaten. Oh, yes: you have to reach your station and return home in forty seconds or less.

If you're lucky enough to make it across the swamp in one piece, you can catch a lift from a flying machine to the feeding station. When you get there you have to scarf down the food. After stuffing your face you turn into a swamp chomper, a big mouthed creature who loves to eat alligator meat. You'll have to hurry to catch a flying machine back to the swamp so you can proceed to munch your enemies. Keep a

close watch on the time: you only have nine seconds of super chomp strength.

After you have lowered the food stock pile at the station, a swarm of bats is guaranteed to make an appearance. Naturally, they're vampire bats out for blood. On occasion, you'll also run into a random ghost with the power of lethal touch; if you happen to be in "Superchomp" mode, you can finish the ghost off for desert, but otherwise, you're a dead chomper.

As a chomper, you're a devoted connoisseur of junk food — and it's a good thing, too, since your feeding station is loaded with ice cream, hot dogs, peanut brittle, soda, and cake. However, you can feed endlessly with no bounds to your electronic appetite, with nary a worrisome thought about obesity, diabetes, or heart disease.

One to two players can play this fattening action game.

**T.A.C.***Avalon Hill*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 9.0  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

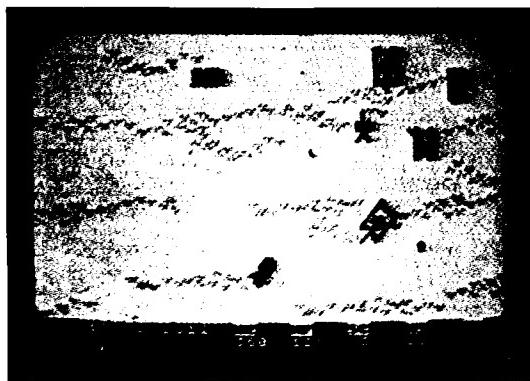
The "Tac" in T.A.C. is Tactical Armor Command, a challenging combat simulation set in World War II. One or two can play, each controlling individual tanks, anti-tank weaponry, and footslogging infantry. Players can select from simulated American, Russian, German, or British forces.

With this repertoire, five games can be played — Meeting Engagement, Rear Guard, Static Defense, Breakout, and Stalemate. The programs offers outstanding graphic quality, using a tactical cartography motif. Like a battle map, the monitor portrays trees, shrubs, contours, and terrain with standard geophysical symbology.

Unlike most combat simula-

tions, this program offers almost freeform flexibility. Neither player is limited to any specific set of boundaries or troop replacement schedule.

The program may offer only a low-to-mid level challenge to aficionados of this genre, but the engaging graphics and versatile tactics make T.A.C. a sure classic of war strategy games.

**Tank Trap***Quality Software*

*System Requirements:* 16K, cassette; 32K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 7.5

*Video Design & Clarity:* 7.5  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$12 cassette  
\$15 disk

Uh, oh: a tank is on the rampage. As a combat engineer, it's your duty to contain the blindly ravaging vehicle by erecting concrete barriers to completely seal off all avenues of passage... If you manage to trap the destructive tank, your rank will be increased based on the amount of time elapsed and quantity of concrete it took you to stop the tank. There is always the possibility that you'll be squashed like an insect.

You use either the keyboard or joystick to manipulate your character around the screen. There are four levels of optional difficulty. On the first level the tank cannot escape from the walls you have built, but your alter ego is free to jump over them. On the

second level, the concrete you pour seems to take its dear sweet time in curing, giving the tank a weak area to attack. The third level of play adds an entourage of helpless civilians; you're assigned the impossible chore of protecting their little citizen lives. If only one innocent bystander gets flattened by the rampaging tank, you lose. On the fourth and highest level the tank is armed with a cannon and can blast through any wall, unless you keep close to its tail.

**Tank Trap** is rudimentary in both design and production. Ample use of color and sound provide the window dressings of a professional piece, but few players will find this program exceptional in any way.

## Target Practice

*Gentry*

*System Requirements:* 16K, disk or cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 7.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$17

This is a simple arcade game, similar to carnival target shooting games. Instead of an air gun you use your joystick when firing at the rows of moving targets. Your amount of ammunition is limited, but you can restock it by hitting the top row of diamonds.

The rabbits, ducks, and

elephants are easy to knock down; but the row of turning faces above the rabbits must be hit when they are smiling. If you hit them when they are unhappy another rabbit is added to the row below. When you have knocked down all of the targets, you are given a bonus bear. Each

time you hit him he changes directions. Your projectile only travels twice as fast as the bear, so if you miss he'll make it to the side of the screen before you

can fire again.

This game is suited more for younger players. The ducks flap their wings and the bunnies hop.

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## Turmoil

*Sirius*

*System Requirements:* 16K, cartridge; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$35

It's turmoil in unfriendly skies as you find your ship in the midst of Aliens, a Ghost Ship, and a Prize that might turn into a Supersonic Cannon Ball — all aimed at your destruction. Only the most practiced skill can use in succession five available ships to survive a wave of attack from the Aliens. There are nine levels of play, each one harder and faster than the one before it. An additional challenge is the occasional ambiguous "Prize" that appears at the edge of the screen and

must be reached before it turns into a Supersonic Cannonball.

The monitor screen is divided vertically with Aliens attacking in waves from either the right or the left edges of the screen. Your ship moves up and down the center, blasting these nasty visitors off the screen while trying to keep moving to avoid a deadly collision. **Turmoil** is an exciting, fast reflex, action game designed to keep one player in competition for a more advanced level.

## Twerps

Sirius

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.0

Your mission is to rescue all the Twerps stranded in craters on a distant asteroid and return them safely to the mother ship.

Keep your ship toward the left side of the screen and it will automatically descend when you are directly over the asteroid. When you have landed, you must use your space vehicle to search the craters for Twerps. Once you locate a stranded Twerp you can pick it up, but be careful of the

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$35

strange creatures who inhabit the asteroid.

You may run into Glingas, birds that scoop up and then drop twerps back in the craters. You might also find Gleepnoks, giant mouths that like to eat juicy Twerps. You can't destroy these creatures, only try and escape them.

This game is designed for one to two players and is controlled by joystick.

## Zaxxon

Synapse

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 8.5

In this computer adaptation of the popular 3-D arcade game, the object is to force your attack shuttle at blinding speed through an obstacle course of asteroid warbases, hordes of enemy shuttles, and still more bases until you finally reach the dreaded robot, Zaxxon, and dispatch him.

The home computer version

*Video Design & Clarity:* 9.0  
*Documentation:* 5.0  
*Difficulty:* 8.5  
*Price:* \$40

has all the captivation, excitement, and 3-D graphics that made the arcade game famous. But in some areas, the computer rendition is even better. Besides the usual quantity of rockets, lasers, enemy fighters and electronic barriers, this version has an additional hazard posed by a mystery fortress with new perils.

Of course, with the computer version, you play endlessly without expending an additional quarter, honing your skills to become a veritable arcade maestro.

The only real "problem" with this **Zaxxon** edition is that it lacks

a Reset option. What's more, you're limited to a maximum of four ships. Still, for the **Zaxxon** enthusiast, and to those who appreciate splendid graphics in a fast-paced coordination challenge, this program is in an elite class of video action games.

## Zeppelin

*Synapse*

*System Requirements:* 32K, disk or cassette; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 7.5

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$35

Here you are with soaring ambitions, the dashing pilot of an experimental zeppelin, and your mission is to destroy all enemy aircraft you may encounter in an austere but expansive, 250-room cavern. Where else would a contemporary zeppelin commander find himself floating around?

Ah, but before you inflate yourself with swaggering confidence, you should know that your enemy is well prepared: his armory includes a battery of laser gates, plenty of falling boulders, a secret cache of balloons and, of course, the usual squadron of hamburger creatures. To make things worse, your errant airship is at the mercy of the wind.

Smash into a cavern wall and you lose your craft.

Now, the cavern is composed of a myriad of passages, some more dangerous than others; choose carefully. During your flight you'll come across various floating keys with which to



unlock parts of the cavern you have yet to explore. You'll also find a few switches lying about, any one of which can disable an enemy craft.

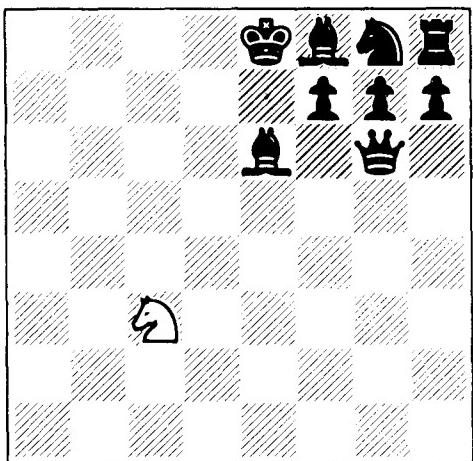
Your joystick controlled zepelin can shoot in four directions. If your ship even slightly touches

anything you lose one of your five lives. You can regain a life by accumulating 10,000 points or touching a life symbol that appears periodically on the screen (life symbol?).

This action is airy, and the response is rubbery.

## Strategy, Sports and Combat Games

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Sargon II — Hayden Software

## Backgammon 2.0

*Dynacomp*

*System Requirements:* 24K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.5  
*Originality:* 8.5

The electronic backgammon simulation from Dynacomp offers the option of rolling real dice or going with the computer's random roll. Either way, the program makes a formidable opponent who knows precisely what you've got up your sleeve and leaves as little as possible to chance.

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$24

You can take on the computer or use **Backgammon 2.0** as a referee as you and a human challenger (preferably someone you're sweet on) level off. In case things get too intimate, you can save the game on disk and retrieve for resumption at some more...er, convenient... time or place.

## Baseball

*Inhome*

*System Requirements:* 16K, cartridge  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

Hot dogs and beer are not included in this vivid simulation of America's springtime pastime. Everything else is here: the crisp crack of the pine bat, the volatile roar of the crowd, the unpredictable throes of individual performance.

This elegant baseball game gives you control over each player on your team. You select your pitcher's pitches, direct your hitters' hitting, even guide your fielders' catches. When a batter

*Video Design & Clarity:* 7.5  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$35

slugs a homer, the monitor scrolls to the outfield, giving you the satisfaction (or disgust) of watching the ball sail out of the park.

You can pitch a fastball, curveball, or a slow pitch (sorry no spitballs). If you don't like the way the batter looks you can walk him. If he manages to hit off one of your pitches, your outfield can catch, throw, and run.

When your team is up, you decide when and how to swing —

drop a bunt or swing for all your animated batter is worth.

If you only manage to get on base, you can always try to steal.

Inhome's **Baseball** is certainly one of the best sports simulations

on the market. Splendid graphics, competent animation, and subtle use of sound and color contribute to a thoroughly playable video challenge.

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## Basketball

Atari

*System Requirements:* 16K, joystick

*Program Depth & Detail:* 8.5

*Support Availability:* 8.5

*Originality:* 8.5

*Video Design & Clarity:* 8.0

*Documentation:* 8.0

*Difficulty:* 8.5

*Price:* \$35

Basketball, as a rule, is a difficult simulation to pull off. The very traits that make the game exciting to spectators are virtually impossible to emulate properly on a computer screen; computer-animated players can't fall into a crouch when dribbling, stutter-step to foil a defender, or transfer the ball from hand to hand while soaring elegantly through the air.

Like other basketball simulations, the Atari version suffers from crude animation and disappointing graphics. However, if you have an active imagination, you'll enjoy the realistic treatment of the challenge of shooting. As in the real thing, shot accuracy is a function of

distance and angle. Unfortunately, you have no way to control the force with which the shot is made or the nuances of leaping height and positioning. As a result, the game is little more than a hybrid "archery" game with the added action of passing the ball around.

This product lacks the subtleties that make "One on One with Larry Bird and Dr. J" so intriguing, and does not have enough visual appeal to warrant its use as a vicarious spectator event. The game will be best appreciated by youngsters who enjoy the sport but aren't wrapped up enough to be competent critics.

## Bridge Master

*Dynacomp*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	9.0	<i>Documentation:</i>	8.5
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	9.0
<i>Originality:</i>	9.0	<i>Price:</i>	\$22

This challenging bridge simulation has freeform flexibility for use as a tutorial and exercise in honing your bidding and playing skills. Decent graphics, a thorough data base of bidding conventions, and facile scorekeeping place **Bridge Master** at the pinnacle of computer bridge software for Atari computers.

The computer deals from a randomly generated deck, then orchestrates the bidding. **Bridge Master** assumes the role of your opposing pair, as well as your

partner. If you don't like the outcome of a particular hand, you can replay it and switch sides — assuming your opponents' hand and giving them yours.

The computer automatically assigns vulnerability and calculates each hand. You have the option of doubling your opponent's bid, as well.

The only missing ingredient is the plaintive shriek of your opponent going down with no-trump after realizing to his chagrin that you woefully overbid your hand.

## Close Assault

*Avalon Hill*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	9.0
<i>Program Depth &amp; Detail:</i>	9.0	<i>Documentation:</i>	9.0
<i>Support Availability:</i>	8.5	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$30

This is surely one of the most challenging, freeform combat strategy games on the market. The program does not attempt to statistically simulate a specific World War II battle, but provides a structured arena for tactical struggle based on the players' own ingenuity.

A game board, military pieces, and game manual are integral to the disk combat. The player can select from a repertoire of pre-designed battle situations or create his own.

As with most Avalon Hill strategy games, the outcome of engagements depends on a

multiplicity of factors, including the relative strength and position of each troop and armament piece, supplies, weather, and "morale." Each factor is reduced to a mathematical value that affects the probability of victory.

The action takes place on a battle grid in which the contour of the terrain, shrubbery, roads,

and structures are mapped in color. The computer referees the confrontation.

We highly recommend this versatile combat strategy for beginning to intermediate followers of World War II battle games. It requires careful planning, a broad scope, and meticulous attention to detail.

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## Computer Chess

Atari Inc.

*System Requirements:* 16K, cassette; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

This cassette-based chessboard simulation is characterized by an intermediate challenge and a somewhat grotesque video display. However, it provides a decent forum for exercising chess skills with a multiple-personality opponent.

Eight levels of difficulty provide a dramatically wide range of game scenarios. At the lowest level, the program is a blundering buffoon, making preposterous errors even a beginner would be embarrassed to counter. No doubt, the lower levels of play are designed to bolster confidence. However, at the higher difficulty levels, the program takes on a more "intelligent" guise.

The worst — and most obvious — shortcoming is an appalling choice of coloration; the board is a hideous orange and green table cloth resembling some psychedelic concoction from a Hollywood Boulevard poster shop. For best results, turn off the color on your television set or monitor.

The joystick controls the movement of pieces; you won't have to remember chess notation or consult a matrix to enter your moves. The program's response time is rather languid in any of the reasonably challenging modes, so don't count on a quick game sandwiched between classes or appointments.

This product is unquestionably the best cassette-based player for

Atari systems, though it lacks the elegance and domination of any of the Sargon disks. It's a good practice mate for students of the

game or casual players not particularly interested in the nuances of strategy.

## Darts

*Thorn EMI*

*System Requirements:* 16K, cassette; joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$30

This vicarious dart tourney from Thorn EMI is an amusing, if indolent, simulation of the real thing. In fact, the game poses you in an English pub, complete with grandfather clock and gabbling architecture.

Your alter ego is seen standing at the marker with dart in hand, aiming uncertainly for the dart board mounted on the distant wall. The computer will display a closeup view of the board as you

take "aim" with your joystick.

Each player has three darts to hurl. This program has a simple solution to the ages old conflict over "linesies." Hit a line between two sections of the board with different scores, and the dart will glance off harmlessly.

The simulation is reasonably accurate, and the graphics are both vivid and engaging. In fact, the computer version is about as occupying as the real thing.

## Gridiron Glory

*APX*

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.5  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$25

This erstwhile simulation of the pigskin pastime is based loosely on NFL statistics. It's not a handicapping program or strength analysis system; it's simply a vicarious spectator event utilizing the names of the major-league pro teams and giving statistical weight to each "team's" relative performance in recent seasons.

As a result, the 49ers will pass often with considerable success, whereas the Rams will mix it up,

with more running plays than pass attempts. The Raiders will play a sticky defense, but the Colts will be as porous as a sieve.

This game combines play calling and joystick action with some realistic touches, including timed games, arbitrary refereeing, and television "graphics" (the broadcast term for those redundant statistics superimposed over the action with agonizing frequency).

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## Guns of Fort Defiance

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*Avalon Hill*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$20

This battle simulation places you at the command of a 19th century artillery brigade. Your stockade is under attack, and you must make preparations for battle.

The computer controls the enemy forces and randomly attacks with artillery, infantry, and cavalry. For each shot you

prepare to fire you must specify the type of ammunition — shell, ball, spherical case or cannister. Be sure to include fuse length when necessary.

You'll also have to compute the elevation and deflection of the cannon. One miscalculation, and you're done for.

## Major League Hockey

*Thorn EMI*

<i>System Requirements:</i>	16K, joystick	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$35

The best things about this lazy man's hockey simulation is that you don't need to know how to skate, the amount of strategy required is limited, and your aggressiveness won't be rewarded with a stick poke in the eye. Especially the latter.

Like "Soccer," a virtual twin simulation from the same distributor, the game is remarkably similar to "Foosball" — a mechanical game played with twirling kickers controlled by rotating knobs. In this electronic hybrid, you control two players' hockey sticks at a time as the puck moves up and down the ice.

Depress the joystick button, and control passes to the skaters nearest the puck at that instant.

The display scrolls horizontally to follow the action over what seems like a rather elongated arena occupying three separate screens. For the most realistic simulation, play in teams of two. Unfortunately, should you take on the computer singlehandedly, you'll find yourself woefully overmatched. The computer's skaters roar around the screen with individual "smarts," while you fumble pitifully with your limited joystick controls.

## Midway Campaign

*Avalon Hill*

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	8.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	9.0
<i>Support Availability:</i>	8.5	<i>Difficulty:</i>	8.5
<i>Originality:</i>	8.5	<i>Price:</i>	\$21

This fundamental strategy game has as its premise the air and sea confrontation between Japanese and American forces over Midway Island, a pivotal engagement of the War in the

Pacific. This is not a simulation of that famous battle, but rather a more freestyle combat game in which the odds clearly favor the Japanese.

As the admiral of the American

fleet, your task is to outwit the computer-controlled enemy forces, which are unlikely to make the same classic blunders attributed to the Imperial command during the real thing.

This is a challenging, though somewhat tedious, strategy game that defies conventional combat

scenarios. The element of unpredictability is more important than position and probability.

Don't expect a vivid, animated simulation of carriers, cruisers, and aircraft. The elementary graphic scheme is limited to rudimentary symbols of your military pieces and their placement.

## Millionaire

*Blue Chip Software*

**System Requirements:** 48K, disk

**Program Depth & Detail:** 8.0

**Support Availability:** 7.5

**Originality:** 9.0

**Video Design & Clarity:** 8.0

**Documentation:** 8.5

**Difficulty:** 8.0

**Price:** \$60

Sure, you've got the investment savvy to barter \$10,000 into a million. It might take 90 weeks or 180: who knows? But can you handle the taxes, the commissions, and debt service, too?

**Millionaire, the Stock Market Simulation** is more of an emulator than a simulator. It provides an interactive theatre for phony stock transactions, with fluctuating prices, options trading, even taxation.

The most realistic part of this amusing investment game is its use of net worth, not gross revenues, to determine a winner. It's not enough to turn your meager cash savings into a fortune by buying and selling high-risk stocks and options. You've got to earn a million more than

your combined loans and interest, tax liability, and brokerage commissions.

You've got 77 turns to buy and sell in an atmosphere of severe flux. Then all your holdings are liquidated before a new round of speculating. Each hypothetical stock has a three-letter name, and you have a choice of 15 different securities.

There's no real string of logical events that influences pricing in this automated market. The changes occur seemingly at random, so there's no qualitative method of predicting performance. The player's analysis is limited strictly to statistical measures. In actuality, of course, statistics play only a partial role in successful securities investing.

The game gets a little repetitive after a hundred or so "weeks" of bartering the same fifteen stocks.

But at least it's all in fun; as with Monopoly, the rewards are only vicarious — and so are the risks.

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## North Atlantic Convoy Raider

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*Avalon Hill*

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.5	<i>Difficulty:</i>	7.5
<i>Originality:</i>	8.0	<i>Price:</i>	\$21

This strategy game is based on the Bismarck convoy raid of 1941. You control the ship while the computer controls the British convoys and battleships. In history the Bismarck was sunk by the Rodney and King George V. You can change all of that, and go on to sink all of the British fleets, including the Hood. If you accomplish that mighty task you can go on a wild rampage through the Atlantic wrecking havoc on the convoy lanes.

It's you against the computer, and here's your chance to change history. The display is divided into a grid representing a single unit of movement; you move your battle pieces across the map

using each cell as a frame of reference. Ostensibly, the strength of each ship in your fleet is statistically linked to historical factors to reflect the actual type and range of weaponry, hull integrity, and maneuverability of the British craft.

Don't expect a vividly graphic action game; this scenario is designed for use with crude symbols that represent the components of the opposing fleets. You maneuver each piece around on the battle grid to form the best placement against the computer's forces. When opposing pieces are moved to contiguous cells, they engage in statistically weighted combat.

## Nukewar

Avalon Hill

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.5  
*Originality:* 7.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$16

This program is based on the much ballyhooed concept of "limited survivable nuclear confrontation" between two hypothetical countries (we all know who they are).

There is no ultimate destruction of the world with the press of a button in this simulation; instead, you must maneuver for positioning using a miscellany of tactics,

including manufacturing, espionage, and military sabre-rattling.

If you prefer you can build jet bombers, missiles, submarines, and antiballistic missiles. You play against the computer, so your strategy plans must be perfect.

This game is designed for one player and is controlled by joystick.

## Paris in Danger

Avalon Hill

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 9.0  
*Support Availability:* 8.5  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.5  
*Difficulty:* 9.0  
*Price:* \$35

**Paris in Danger** is a classy simulation of Napoleon's 1814 campaign in France. The game pits the Imperial Army against the combined Austrian, Prussian, and Russian forces.

You can choose to be either Napoleon or Commander Schwarzenberg. If you like you can play both sides to recreate the actual battle. You compete on both tactical and strategic levels

on a scrolling map of France and the surrounding countries.

This game is designed for one to two players and the action is controlled by joystick. A loose statistical relationship binds the likelihood of victory to each opponent's forces. Battles are waged whenever two or more opposing pieces come into contact, and the outcome is dependent in part on weighted factors for position,

troop strength, and morale. However, there's an indisputable role played by luck as well.

Afficionados of combat simulations may look askance at this

game's lack of precise detail, but admirers of ambitious strategy contests will appreciate this product's elegant scope, illustrious context, and classical backdrop.

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## Pensate

*Penguin Software*

*System Requirements:* 32K, disk; 24K, cassette  
*Program Depth & Detail:* 8.0  
*Support Availability:* 9.0  
*Originality:* 9.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.5  
*Difficulty:* 8.5  
*Price:* \$35

The object of this chess-like strategy game is to maneuver your solitary playing piece to the top of the board against a selectable combination of chess pieces controlled by the computer. Your piece is the equivalent of a King stranded at end game with all his subject pieces taken from the board. It moves only vertically or horizontally one space at a time — never diagonally. Comes in contact with any of the computer's pieces and the game is over. Once you move

your playing piece, the computer moves all its pieces at once, according to their respective freedoms. The repertoire includes rook-like directional pieces that can move horizontally only or vertically only, a knight that moves one vertical or horizontal space plus one diagonal space, and a multi-directional "queen."

In practice mode, you can take on the computer one move at a time, but in the "game" mode, you have to think ahead three moves.

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## Pipes

*Creative Software*

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 9.0  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.5  
*Difficulty:* 8.5  
*Price:* \$35

This game walks a fine line between education and entertainment. It contains several unique learning functions appropriate for grade schoolers on up.

Arlo, the water works man, is tasked with connecting from one to five houses in the town of Gilroy, California to the main water reservoir. To accomplish this formidable task, Arlo has at his disposal a miscellany of pipes — all of various types, lengths, quantities, and prices.

As Arlo, you select pipes from the "factory" by using the joystick to position yourself next to the pipe of your choice; press the joystick button, and the component is yours. One by one, you connect all the pipes you've selected. The job is tedious to say the least, and the interminable

sound of Arlo's creaky joints soon grates on the nerves.

Now, Gilroy is much too expansive to fit on your computer screen in a single display, so you work on a reduced scale model of the town. Your own actions are displayed in a left hand corner of the screen. As you proceed, the computer keeps a running tabulation of your accrued costs and the quantity of pipe remaining.

When you've finished connecting the system, Arlo opens the valves; water pours — or leaks — through the pipes to the connected domiciles. The computer displays a summary of your performance, leaving you to try to mend the faulty system and spend less of the town's tax money in the process.

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## Pool 1.5

*Innovative Design*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 9.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

Here's a truly vicarious experience with a curious contradiction. The program emulates four types of pool — straight, rotation, eight or nine ball. The contradiction is that, as a simulation, it really does nothing to improve knowledge, skill, or technique. In effect, it's just a lazy man's pool table — and an extremely lazy man, at that.

Yet as a video action game, this is a superior product with excellent production values. The graphics are lucid, the effects are realistic, and the simulation can be controlled.

To "shoot", the player selects from a menu of commands,

which include regular aim, fine aim, and shoot ball. The program also has freeze-frame and instant-replay modes, so you can examine the projectory in isolated time and space.

This is an admittedly slick, though only mildly entertaining, simulation. Aiming a pointer on the monitor with keystroke commands isn't quite the same as chalking up a stick down at the local tavern. Then again, you won't have the risk of ramming the cue into the fabric and popping the ball into the drink of a nearby Hell's Angel (what are you doing in those kinds of bars anyway?).

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## Pool

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*Thorn EMI*

*System Requirements:* 16K, joystick  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 7.5  
*Price:* \$30

Pool players are the least likely to appreciate this vicarious game of Eight Ball. After all, there's nothing like the real thing to exercise essential skills. This simulation looks like the real thing, with glowing green felt and multi-colored balls. The computer recognizes only the basic rules, with none of the "house" rules you'll find in most pool parlors and taverns.

To "shoot" you simply point with the cursor to the ball you want to hit. In short, it's relatively random, slowly paced, and seemingly pointless. There's nothing about this nicely designed video scenario that will exercise any of the physical precisions required to excell in actual competition — with the possible exception of the rules.

As a result, the game has a

short interest lifetime and only a moderate degree of challenge. However, it's sure to delight the

younger set, save on cue chalk, and eliminate torn covers.

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## Saratoga

APX

*System Requirements:* 32K, cassette or disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.0

*Video Design & Clarity:* 8.0  
*Documentation:* 7.5  
*Difficulty:* 8.0  
*Price:* \$25

General Washington has selected you to foil the three-pronged attack planned by the British commanders Burgoyne, St. Leger, and Howe. Your troops are hungry and exhausted, but time is one commodity of which you have little to spare. The enemy target is Albany.

Lose this one and you lose freedom for the colonies. As you begin the game, the Redcoats have been spotted marching through New York...

You play this game on a map covering the eastern United States, spanning from Main to Philadelphia and including a few inland areas. You have twelve months in which to beat back the British from Albany, Philadel-

phia, Ft. Ticonderoga, and West Point. You command the Revolutionary Militia; the computer controls the British.

The troops are represented on the battle grid by squares, each having a maximum of eight moves per turn. When opposing markers touch, a battle erupts. The computer will calculate the combat odds, using terrain, muster, and direction to determine the outcome.

The program offers eight possible scenarios and a save-game feature. It's an engaging combat simulation played out in classical battle-grid style and with a unique American Revolutionary premise.

## Sargon II

*Hayden Software*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 9.0  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 8.0  
*Documentation:* 9.0  
*Difficulty:* 9.0  
*Price:* \$35

The **Sargon** series is presumably the definitive computer chess challenge. With levels of sophistication ranging from beginner (0) to Grand Master (7), this program is probably the most popular all-purpose chess tutorial and simulated opponent on the market. There are several versions, the best of which are the contemplative **Sargon II** and the Grand Master **Sargon III**.

The level of flexibility is ingenious. The computer can play dumb or be as intimidating as you like. The program has good response time, even though the producers have apparently created an artificial pause for "thinking." Computer chess players are often antagonized by the computer's ability to respond instantaneously to the user's own, carefully pondered move. So, chess software writers often program the computer to delay its move and pretend to "worry."

Sargon also tells you how far

ahead it's thinking, by displaying the number of future moves it already has planned. Chess is one of the finest games any computer can play; its concise but flexible rules, diverse strategies, and historical base of classic maneuvers provide a rich foundation for programming.

**Sargon II** takes advantage of many of these resources, playing a heartless game with recognizable strategies from famous matches — and sometimes appearing to cheat, by the way.

With this opponent, it's wise to castle always and castle often. A purist may snub this program for its cold and calculating manner, but myself a mere 1400-point competitor, I find Sargon more challenging, enlightening, and graphically entertaining than any of the self-contained computer chess products.

The suggested list price is \$35 — about half the price of a brainy board version.

## Soccer

*Thorn EMI*

**System Requirements:** 16K, cartridge; joystick  
**Program Depth & Detail:** 8.5  
**Support Availability:** 8.5  
**Originality:** 8.5

**Video Design & Clarity:** 8.0  
**Documentation:** 8.0  
**Difficulty:** 7.5  
**Price:** \$45

In the mid 1970s, adolescents were enthralled by a popular tavern game called "Foosball." A cross between soccer and rugby, it featured spinnable kickers in fixed positions — including a goalie — which each player had to manipulate individually by rotating a series of handles. With the advent of electronic arcade games, Foosball went the way of James Taylor and Pong, but the premise lives on in this vivid computer simulation distributed by Thorn EMI.

The play takes place on a one-third view of the soccer field; the monitor scrolls horizontally to keep up with the action as the ball moves up and down the field. As in Foosball, the player

can only control one kicker at a time. By depressing the joystick button, you transfer control to whatever player happens to be nearest the ball at the time. Also like Foosball, the game is based simply on booting the ball around, hopefully landing it in the goal.

The game supports play by up to four players, assuming you have enough joysticks to accommodate the action. The game is best balanced with four players and similarly provides the most realistic scenario — calling for cooperative play and coordinated skill. You'll find the toughest challenge in one-on-one confrontation against the computer.

## Spy vs Spy

*Program Design, Inc.*

**System Requirements:** 16K, cassette; 32K, disk  
**Program Depth & Detail:** 8.0  
**Support Availability:** 7.5  
**Originality:** 8.5

**Video Design & Clarity:** 7.5  
**Documentation:** 7.5  
**Difficulty:** 8.0  
**Price:** \$19 cassette  
\$24 disk

Imagine you're a master spy trying to guess the password that will help you gain entrance into an embassy. If your mission is successful, you'll be paid in coin of the realm or even earn a bonus for fast and accurate work. You'll then have the "honor" and title of Super Spy — no doubt, every code breaker's private ambition. But fail, and you'll be reduced in rank and forever known by the appellation "James Bomb."

**Spy vs. Spy** is a word guessing game based on the premise of

decrypting a secret code word. The four letter word is randomly chosen from a master list. The player takes turns at spelling various guesses, based on the computer's clues.

For each entry, the computer responds with the number of letters in the guess word that are also contained in the "password." You also learn which letters are in the same or different positions.

Play continues in this fashion until the student has made a dozen guesses.

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## Treasure Quest

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*Adventure International*

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 7.5

*Video Design & Clarity:* 7.5  
*Documentation:* 7.5  
*Difficulty:* 7.5  
*Price:* \$15

In **Treasure Quest**, you'll "captain" an eighteenth century sailing vessel called the Zombie. As you begin your adventure, your search for treasure has already led you halfway across the globe, landing you at your current location, the notorious Blood Straights. Many have preceded you here and perished.

Your aids will include a detailed map of the area, an experienced navigator, and a seasoned crew of sea dogs. Your im-

pediments will consist of unpredictably violent weather and a British Naval contingency that will invariably mistake you and your crew for a band of unscrupulous pirates. Not only that, your crew may be thinking about mutiny, as the hurricane season begins to sweep in over the horizon.

The instruction manual contains a few hints for getting yourself into this jam competently. The computer randomly

generates a new opening scenario each time the disk is booted, so you and your horde of unwashed

can enact this timeworn boyhood fantasy on an almost unlimited supply of knockdown stages.

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## T.G.I.F.

*Avalon Hill*

*System Requirements:* 32K, disk

*Program Depth & Detail:* 8.5

*Support Availability:* 8.5

*Originality:* 9.0

*Video Design & Clarity:* 8.5

*Documentation:* 8.0

*Difficulty:* 8.0

*Price:* \$20

Looking forward to Friday? This game tries to recreate a typical week for the working stiff. Monday (already) is the day all the bills come due. Tuesday is lottery day, if you feel that Lady Luck is on your side, buy two or three tickets. Then comes good ol' hump day, Wednesday: it may bring you great profits or bomb out altogether. Thursday is investment day, when you'll be

tempted with land deals, timber rights, and luxury boats.

At last comes Friday, every player's favorite. In this episodic role playing game, every Friday is payday. Saturday in this game isn't filled with mundane chores, but a treasure hunt. Sunday is a day of rest.

This game is designed for one to four players and takes about an hour to play.



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## **Adventure Fantasies and Mysteries**

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## Ali Baba & the Forty Thieves

Quality Software

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	7.5	<i>Documentation:</i>	7.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	7.5
<i>Originality:</i>	7.0	<i>Price:</i>	\$35

This high-resolution adventure combines rich graphics with an engaging narrative in a flexible format for youngsters. This familiar premise includes an expected cast of characters (evil sultans, magical creatures, and of course, thieves) and a few not-so-expected individuals (dwarfs and elves).

This game accommodates more than one player, assigning each youngster a different persona. The level of complexity (and peril) can be adjusted according to the age and ability of the player. Games can be interrupted

and saved for future resumption.

Sound and color add to the program's appeal. **Ali Baba** seems to captivate children's attentions for prolonged periods. For one thing, most of them have trouble getting past the first few scenarios. To progress through the adventure, the child has to make pivotal decisions about what action to take. The choices are simple and to the point, but the consequences are frequently abrupt. A single game might take days to complete in several, abbreviated sessions.

## Clipper: Around the Horn in 1850

Program Design, Inc.

<i>System Requirements:</i>	24K, cassette; 32K, disk
<i>Program Depth &amp; Detail:</i>	8.0
<i>Support Availability:</i>	8.0
<i>Originality:</i>	8.5

Imagine yourself at the helm of a sleek Yankee clipper with the sting of salt in your eyes, the slap of the brisk sea air against your brow. Well, would you settle for a computer fantasy aboard a "greyhound of the sea," with you in deft command?

<i>Video Design &amp; Clarity:</i>	8.0
<i>Documentation:</i>	7.5
<i>Difficulty:</i>	8.0
<i>Price:</i>	\$30

This game has you sailing from New York to San Francisco via Cape Horn (the Panama Canal hasn't been constructed yet). The object is to traverse the distance in the shortest possible time, relying on your innate shrewdness and ocean wiles. To win, you'll

also have to economize, avoiding costly repairs from turbulent encounters.

Your peck of perils will include raging storms, deadly clams, and the ever-popular mutinous maties. Along the way, you can look forward to having your mast snapped in two by hurricane force winds, and your crew struck down by a sudden plague. Icebergs and reefs supply additional spice.

As captain you must choose the amount and type of cargo to

carry, how many hands to hire, and how much food, water and other provisions are needed for the long voyage. You must be an accurate nautical map reader, be able to read a compass, interpret and react to changes in weather, wind speed and direction. Mis-judge on any account, and you'll be in port for costly repair work.

This game features nautical graphics, an (unintentionally) hilarious synthetic voice track, and a few sailing stories from a salty old sea dog.

## Crypt of Medea

*Sir-Tech Software Inc.*

**System Requirements:** 48K, disk

**Program Depth & Detail:** 8.0

**Support Availability:** 9.0

**Originality:** 8.5

**Video Design & Clarity:** 8.5

**Documentation:** 8.5

**Difficulty:** 8.0

**Price:** \$40

Driving at night on a desolate road, you peer through the windshield for a familiar sign. The way grows more difficult with every turn. The night is ominously still — in a scenario like this, a sure signal that something eery is about to unfold.

Without warning, a silhouette flashes in front of the car. Looking back, you try to catch a glimpse of whatever it was. But there's nothing... no one... only a solitary leaf blowing low across the earth. Turning your eyes back to the road, you gasp in terror.

Something horrible is standing in the middle of the road, but as you slam on the brakes you plunge into consciousness.

As you awaken, you realize you're trapped inside a mausoleum, with no way out.

The trapped player must try to escape using trial and error, logical deduction, and manipulation of various objects conveniently lying around in the dark. You'll have to exercise caution and judgement: anything you pick up could prove dangerous to your health.

Most events follow in a logical order. When you enter a move that results in your gruesome death, remember it so it doesn't happen twice.

The player enters actions and decisions with the CTRL key in conjunction with selected letters.

Fortunately, the game can be saved and restarted an indefinite number of times; no doubt it will take you months just to reach the denouement.

A user's guide supplies helpful hints, key words, answer sheet, and a list of coded words.

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## Crypts of Terror

### Inhome Software

*System Requirements:* 16K, disk or cassette  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

Somewhere in a chest inside one of fifty crypts is stashed the Magic Ring of Power. It's your job to find it and return it safely to the first crypt — assuming you manage to survive the ghastly horde of monstrosities intent on ripping you limb from limb.

For protection, the computer equips you with a sword and rifle. But run out of bullets, and you're easy prey for a voracious viper.

Now, you'll come across several utensils on your trek through the cheerless chambers, but this adventure has a unique twist: you can only carry one item at a time. Not only do you have to fend your way through

the bleak maze, you'll also have to remember where the various implements lie strewn. To unlock a chest, you'll have to return to find a key, exchange it for your rifle, then maneuver back to the chest. Each time you successfully open a new chest, you'll be shown a map detailing the contents of each room.

Run into a dragon, and you lose valuable life points. Ah, but discover a food supply in one of the chests — or bribe the Tree of Life with gold coins — and you'll recoup on your life expectancy.

Your crew of three adventurers is irreplaceable. Lose them all, and you lose the game.

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## Curse of Ra

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Epyx

<i>System Requirements:</i>	48K, disk	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	8.5
<i>Originality:</i>	7.0	<i>Price:</i>	\$20

**Curse of Ra** is a self-contained adventure, but not a self-contained game. This product is a "plot" add-on for the popular Temple of Apshai prose adventure leading the player on a grueling pursuit of the sequestered treasures of Ra. As any serious adventure aficionado knows without blinking, Ra is the Egyptian god of gods, parent to Apshai and lord of the demon sun. Desecrate his temple and you can forget about living happily ever after.

This game extension poses four convenient "dungeons" to in-

vestigate. Inside, the untold wealth of Ra sits somewhere in a dark and musty chamber, waiting for some tenacious Atari user. Wrong ways lead to a hundred different chambers populated by unspeakable perils. The dramatis personnae includes an impudent jackal, an arrogant cobra, and (what else?) a mummified ancestor of... well, no point in diluting your expectations.

How far you progress along the quest depends on the decisions you make at each juncture. The first one is the \$20 asking price.

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## Deadline

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Infocom

<i>System Requirements:</i>	32K, disk	<i>Video Design &amp; Clarity:</i>	7.5
<i>Program Depth &amp; Detail:</i>	8.5	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.0	<i>Difficulty:</i>	9.0
<i>Originality:</i>	7.0	<i>Price:</i>	\$50

You're a hotshot big city detective called to a sprawling house in the middle of the night to investigate an apparent suicide. The city fathers have placed a twelve

hour time limit for solving the case. But the clues seem to say "murder." Seven suspects and a web of untruths stand between you and the deadline.

There are 25 different ways the case can end. The player works from an actual dossier, piecing together a myriad clues scattered throughout this nicely packaged mystery game.

This product has some realistic touches and a mature tone. Like other adventure fantasies marketed by Infocom, this one is typified by a bombastic prose style and highly stereotyped characters. The *dramatis personae* have a comic-book quality about them that contributes little to the "mystery." However, the plot is intricate — depending, of course, on the specific decisions you make and instructions you enter.

Be forewarned: the authors have added a fourth-dimension usually overlooked by the contrivors of this genre. As your

perplexed alter ego plods along from scene to scene, the environment changes with the passing of time. While you're "busy" interviewing a subject or examining an object, the plot continues to progress.

The longevity of your interest in this program depends on how soon you manage to unravel the mystery. Despite the relatively large number of resolutions, the program's rigid cast and setting are likely to wear thin with "real" time.

But despite its hackneyed qualities and a few logical inconsistencies, **Deadline** is a challenging exercise in deductive reasoning — a complex puzzle with innumerable variables and some very "dead" ends.

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## Death in the Caribbean

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*Microlab*

*System Requirements:* 32K, disk

*Program Depth & Detail:* 8.5

*Support Availability:* 8.0

*Originality:* 8.5

*Video Design & Clarity:* 9.0

*Documentation:* 8.5

*Difficulty:* 8.5

*Price:* \$35

Here's a popular prose-based adventure fantasy with a contemporary setting and a tropical motif. But don't look for off-duty airline stewardesses clad in minuscule bikinis or stolid planes of white sand washed methodically by a crystal blue surf. In this

tropical survival test, your *dramatis personae* includes ants, alligators, and archetypical doom.

The script poises you on an unmapped island somewhere in the Caribbean. There's only you, a buried treasure, and... well, something terrifying. A little

voice inside your brain chip keeps warning you you're in danger.

Naturally, you can't hang around basking in the breeze all day. Instead, why not go trekking off through treacherous terrain, battling all odds of survival? It's either that, or check into Club Med (a horror worse than killer ants).

So, off with you! Go scale a few cliffs, negotiate a couple of bottomless pits, and writhe around in a little quicksand (after all, your travel agent did book the economy fare). You might

stop off to battle a few giant ants on your way to the alligator-infested swamp.

You'll need all the clues you can glean, if you expect to find the treasure and escape from the island in one piece. Your only guide is your instinct and a map.

High-resolution graphics help you visualize the scenarios. **Death in the Caribbean** (known affectionately as DICkey by followers of macabre adventure fantasies) is a classic in the field of arduous and pointless prose puzzles.

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## Demons Forge

*Boone*

*System Requirements:* 48K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 7.5

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

You're bound in chains and manacles, bloody from your efforts to free yourself. But in the final judgment, the king spares your life for your past loyalties. Uh...there's just one catch. To prove your worthiness, you'll have to be the first person in history to discover the way out of Demons Forge.

Your only survival equipment

in the infamous maze of death is a small pack of rations. Will you shock the kingdom and defy the secrets of centuries by finding the exit?

Probably not, but you're welcome to try. Eighty rapidly assembling color illustrations will give you plenty to puzzle over.

This challenging fantasy requires a color graphics monitor.

## Galahad and the Holy Grail

APX

*System Requirements:* 32K, disk; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 8.0  
*Originality:* 8.5

This beginner's adventure fantasy takes place in the days of King Arthur's Roundtable, and you're one of the questors after the Holy Grail.

You begin the challenge by taking an oath pledging you to the accomplishment of a specific goal; your options include finding three keys, locating the Holy Grail, returning the Grail to the castle, or overcoming any monsters that might stand in the way of the quest.

The joystick will maneuver your knight through treacherous terrain — climbing walls, negotiating desolate roads, meandering through dank forests.

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$30

So far, nothing unusual. Ah, but some of the walls possess magical properties: crawling over them transports you to another dimension in time and space.

Your trek will pit you against dragons, black knights, and giant spiders. If you're smart, you'll pick up one of the conveniently scattered implements you'll find along the way. Most of them will be integral to mastering one or another dreaded foe.

If you are playing in a group, the game will end when one of the challengers defeats you. Another game will start, giving another player a chance to succeed in the search.

## King Arthur's Heir

Gryphon Systems

*System Requirements:* 16K, cassette; 40K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 7.5  
*Originality:* 7.5

Imagine you're the heir to the throne of Camelot, but to assume the throne and rule as king you

*Video Design & Clarity:* 8.0  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$20 cassette  
\$30 disk

must first prove yourself worthy of the highest honor. For this singular purpose, Arthur has

devised a test: you must retrieve the highly valued Scroll of Truth. The scroll has been hidden by the great magician and sorcerer Merlin. Should you accept the challenge — and you'd better, if you hope to derive any satisfaction at all from investing in this program — you'll receive instructions from Merlin on how to successfully solve the puzzle.

Here's what you'll have to do: first, trek through seven realms including a mystical forest, an enchanted castle, a magical city, and dangerous caves. Some of these locations will contain conveniently abandoned implements you'll need for your journey, others will hold only danger. Along the way, you'll have to

battle computer dragons, barter shrewdly with mystical enchanters, even duel with the devil. That's where the conveniently abandoned implements come in. Find a magical staff and a ring possessing great power, and you'll be in relatively good shape to take on these ill-mannered contestants.

This tedious and puerile scenario is a composite of virtually every stereotype known to pointless adventure puzzles and poorly written paperback fantasy novels. Unimaginative, unoriginal, and unendurable, it's strictly for dungeons-and-dragons addicts who could care less about characterization, plot, or production quality.

## Questron

*Strategic Simulations*

**System Requirements:** 48K, disk  
**Program Depth & Detail:** 7.5  
**Support Availability:** 8.0  
**Originality:** 8.0

**Video Design & Clarity:** 8.5  
**Documentation:** 8.0  
**Difficulty:** 8.5  
**Price:** \$50

This "dungeons and dragons" adventure from a reputable producer of simulated combat games places your alter ego in a mysterious realm in a time when magic, monsters, and malevolence were ho-hum. The game's progression depends on the correct entry of a decision or action at various crossroads.

Your adversary is an unruly wizard whose nasty habits and negative attitude have the inhabitants of the Questron Empire in a snit. The magician's cadre of chums isn't particularly savory, either.

As is usual with this sort of thing, the first problem is arriving at the correct "solution" for each

turn of events. The entry of actions is freeform, so you've got to figure out whether to turn, exit, take something, move on — not really knowing the consequences until it's too late to do anything about it. Successful completion of the game requires an enormous repetition of trial-and-error decisions.

Monster-for-monster, this

adventure probably offers as many perilous concoctions as any program in its class. Naturally, there are a few dozen places to roam around half-blind, guided primarily by the prose narrative. There are some very good production values here, using skilled graphics and the latest visual tricks.

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## Seastalker

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Infocom

System Requirements: 32K, disk  
Program Depth & Detail: 7.5  
Support Availability: 8.0  
Originality: 8.5

Video Design & Clarity: 7.5  
Documentation: 9.0  
Difficulty: 7.5  
Price: \$40

In the least known fathoms of the ocean stands the striking silhouette of the Aquadome. The undersea research facility represents the pinnacle of human handiwork. But now a sinister threat endangers the laboratory's very existence. Only you and your sub can solve the mystery, thwart impending peril, and preserve the Aquadome.

**Seastalker** is a juvenile fantasy game from the makers of "Zork" and "The Witness." An all-prose puzzle modeled after innumerable dungeons-and-dragons scenarios, this program poises the player as the protagonist in a fictional sea hunt. A wealth of ancillary aids, including secret cards, a

nautical guide, a captain's log, and a decorative sticker, gives an added boost to the child's own imagination.

The mystery leads the player through unknown waters fraught with unseen dangers. The way must be carefully charted to avoid duplicating false starts or re-encountering aquatic monsters. The maneuvering and mapping is tightly interspersed with uncontrollable hazards, ranging from mysterious acts of mutiny to oceanic disturbances.

The program relies on a simple English syntax with which the child can carry on a rudimentary conversation with the computer, as he seeks to unravel the

elaborate puzzle. Overall, **Seastalker** is an excellent exercise in analytical problem solving, notetaking, and deduction for young children. The characterization and plot are decidedly amateurish, but certainly no more

puerile than the standard entourage of wizards, goblins, and monsters that inhabit other prose fantasies. As with other adventure programs, it's the puzzle, not the trappings, that's important.

## Shamus: Case II

*Synapse*

**System Requirements:** 32K, disk

**Program Depth & Detail:** 8.0

**Support Availability:** 8.0

**Originality:** 8.5

**Video Design & Clarity:** 8.0

**Documentation:** 8.0

**Difficulty:** 8.5

**Price:** \$35

As **Shamus**, private eye extraordinaire, you find yourself battling your way through a tortuous, subterranean labyrinth. There's only one thing on your mind: your archenemy, the Shadow, who waits patiently for your arrival — assuming, that is, that you somehow make it through alive.

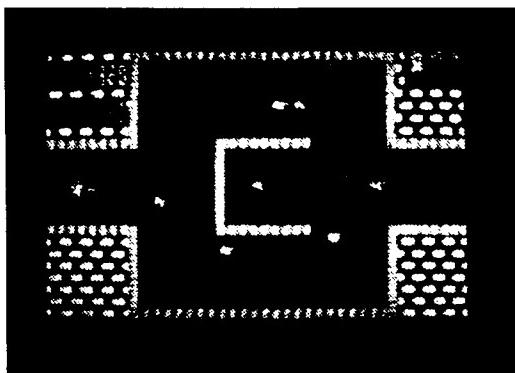
You see, there's a few dramatis personae here who'd just as soon you didn't survive. The entourage includes a few poisonous snakes, a band or two of mutant creatures, and, of course, the ubiquitous ladders with the disappearing rungs.

In some of the chambers you'll explore, you'll have to destroy more than a dozen mutants before they reach the floor. If

one of them so much as lights foot on the platform where you stand, it'll be your downfall (and I mean that literally).

For a map of the areas you've successfully explored, press the spacebar. You'll quickly locate your present location and glean how far you have to go to reach the Shadow. Press the bar again to return to play.

There's enough standard peril,



mappable puzzle, and reflex challenge to make this game a potential classic. The relative

complexity and malleable screen displays give this product a longer than usual lifetime.

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## Starcross

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*Infocom*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 8.5

*Video Design & Clarity:* 6.0  
*Documentation:* 8.5  
*Difficulty:* 8.0  
*Price:* \$50

A starship as large as a planet. So immense it obscures the stars, blackens the horizon, looms like a black hole over the vacuous facade of space. Your own paltry scout ship makes its way in seemingly infinitesimal spurts toward its rendezvous with your destiny.

Inside are eighty "dungeons" (unmapped chambers) and countless "dragons" (unpredictable aliens) posed between you and the ultimate fulfillment. The scene may be high-tech, but the context is familiar. **Starcross** is an exclusively prose-based adventure with an exceptionally expansive dictionary. There are no illustrations, animated sequences, or action games.

The program is like an elaborate puzzle consisting of a diverse assortment of scenarios and possible developments. To proceed through the adventure, the player must make critical

decisions at key junctures. Depending on the decision, the computer will branch to a new scenario.

This adventure relies exclusively on English language input. That's where the dictionary comes in. **Starcross** "understands" more than 600 words and sentences which the player must use to advise the computer of his decisions. It's as if you and the computer reside inside the hero's brain, and your job is to type out instructions for every simple motion, from stretching out the arm to grasp an object to turning toward an exit.

The software is accompanied by an instruction booklet and a game chart. This product is a hit with "dungeons and dragons" enthusiasts for its all-prose design, ambitious vocabulary, and intricate architecture.

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# Suspended

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*Infocom*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.5  
*Support Availability:* 8.0  
*Originality:* 9.0

*Video Design & Clarity:* 7.0  
*Documentation:* 8.0  
*Difficulty:* 8.5  
*Price:* \$35

You were locked in suspended animation as a safeguard against disaster on a space station controlled by an all-robot crew. On the station's performance depends the lifeblood of a planet. The inhabitants' climate, nourishment, and mobility all hang in the balance. But with a team of six computer-controlled androids meticulously programmed for uncomplaining loyalty, what can go wrong?

Suddenly you wake from your suspension with an alarm ringing in your brain...

The object of **Suspended** is to avoid planetary disaster by solving the crisis of your life giving space station gone beserk. Each robot is programmed for repair and maintenance. Three computer consoles manipulate their every action. In this prose adventure game, you input their actions as

timely and effectively as you can. With the right decisions in the right order, you just might restore order to the station and win the game...

This is a unique adventure game with a futuristic appeal. There are no "dungeons" to explore, but plenty of confusing compartments to strand a misguided robot. Its constructive, crisis solving plot is a refreshing alternative to the more tawdry violence typical of computer adventures.

Unfortunately, there's really only one solution. Once you deduce the successful plan, the game will offer but a whisper of a challenge thereafter. However, you can choose from three levels of complexity.

A game board is supplied with the software.

## Temple of Apshai

Epyx

System Requirements: 48K, disk  
Program Depth & Detail: 7.5  
Support Availability: 8.0  
Originality: 8.5

Video Design & Clarity: 8.0  
Documentation: 8.0  
Difficulty: 7.5  
Price: \$40

On a quest for treasure through the 200 room temple, your only companionship is a miscellany of malevolent monsters, disorderly demons, and treacherous traps. So what did you expect — a Broadway chorus line?

In **Temple of Apshai**, there are 80 different treasures to be plucked, all surrounded by slashing daggers, consuming flames, and bottomless pits. Naturally, each is guarded by one or another dastardly demon or vile vermin.

This program was designed as the first episode in a series of gory fantasy adventures called "Dunjonquest." As dungeons and dragons go, this product is a good challenge with an easy syntax and helpful graphics. The plot develops in direct relationship to the instructions you supply.

**Temple** poses you as a perplexed adventurer with limited sensory

competence. The computer provides your only perceptions — a stilted view of a cavern or chamber, a tactile impression of some conveniently abandoned object, or occasionally, an ominous noise or clatter.

To complete the adventure, you must enter decisions and actions at various junctures in the plot, depending on what you see, feel, or hear. The outcome depends on just what decision you make — for instance, flee or stand and fight.

**Apshai** is one of the more macabre adventure fantasies with a rather loose geo-historical basis. It does not rank among the most perplexing or bombastic in this genre, but offers better than average intrigue. Environmental conditions seem to change at random, adding confusion and unpredictability to an otherwise tedious adventure.

## The Witness

Infocom

System Requirements: 32K, disk  
Program Depth & Detail: 8.0  
Support Availability: 8.0  
Originality: 8.5

Video Design & Clarity: 7.0  
Documentation: 7.5  
Difficulty: 8.0  
Price: \$40

A wealthy heiress that could make a blind man blink. A Chinese butler with an expression like granite. A *dramatis personae* that could bring shivers to a statue. Someone wasted a high flying socialite. But who? And why?

A stack of clues lies in a clutter across your desk. Outside, a newsboy screams about the German invasion of Austria. The year is 1928. And you're about to take on the grimmest, most elusive crime you've ever solved.

This game poses you as a big-city detective called to the scene of a murder by a fearful husband. Naturally, he's snuffed out mercilessly as you "look" on through your mind's eye. It's your duty to unmask the perpetrator from a trio of obvious suspects.

**Witness** has a simple English vocabulary. The player keys in abrupt sentences composed of words from the list to indicate a decision or action. Depending on the input, the program branches to one of several possible scenarios. Branching in this fashion, the program culminates in a solution to the crime — or the detective's sudden demise. As mystery fantasies go, **Witness** has a decent vocabulary that adds in-

terest to a potentially tedious scenario.

This prose adventure is a strenuous exercise in attention to detail and deductive reasoning. The dead ends are plentiful, and the miscues common. Half the problem is getting the computer to accept your input and advance the plot.

Mystery enthusiasts will appreciate the program's many intricacies, stereotypes, and 1920s backdrop. Like other adventure games from Infocom, this program has a decidedly wry humor about it. The prose is rather elaborate, probably to distract more than impress. The plot unravels like a Chinese puzzle, with each piece seeming to obfuscate the solution more than it contributes to it.

In all, **Witness** is a better than average challenge, though its trappings can hardly avoid seeming hackneyed and stereotyped. From Phong, the inscrutable oriental, to the arrogant, jewel-clad heiress, the characterization suffers from a decided lack of imagination.

Ignoring its comic-book mentality, mystery enthusiasts will find this game to be one of the more perplexing and interactive programs of its genre.

## Wizard and the Princess

*Sierra On-Line*

*System Requirements:* 32K, disk  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$35

**The Wizard and the Princess** is a keyboard controlled adventure game with an imaginative story line, more than one hundred excellent graphic illustrations, and an intriguing array of problems to solve.

Imagine that you are nonchalantly moseying through the sunny kingdom of Serenia looking for adventure when, sure enough, King George's poor Princess Priscilla is abducted by Harlin, a wiley and wicked wizard. What seems like a simple rescue becomes a dangerous and thought-provoking challenge in-

deed as the powerful wizard conjures up frightening obstacles to keep you from rescuing the fair maiden in distress. Snakes, scorpions, and all types of dangerous creatures accost you as you travel through desert, canyon, wooded beach, two tropical islands, and a rickety bridge, to the magic castle and princess.

Careful examination of pathways and objects help you plan your search. Magic passwords open doors and guide you on your way. This game is designed for one player at an intermediate level.

## Zombies

*Bram Inc.*

*System Requirements:* 48K, disk; joystick  
*Program Depth & Detail:* 8.0  
*Support Availability:* 7.5  
*Originality:* 8.0

*Video Design & Clarity:* 8.5  
*Documentation:* 8.0  
*Difficulty:* 8.0  
*Price:* \$35

Wistrick the evil has hidden seven crowns in seven musty dungeons (have you ever heard of a sterile dungeon?). It's your particular responsibility to recover them.

Each dungeon has ten rooms you must explore, but you're virtually unarmed. Your only weapon is a satchel of 32 talismans of Rhadamanthus. These handy condiments can stop

a pursuer dead in his tracks, but alas, their effect is as fleeting as smoke (the smoke of burning tires, that is — say, oh, four seconds or so).

You will need acrid accoutrements when you run across the zombies, snakes, spiders, and deadly orbs of evil that hang out in the myriad chambers of the seven dungeons. When things get really tight, you can reach for spells; touch a mystical scroll (you'll find them cluttering up various dimly lit corners of the dungeon) and you'll freeze your attacker where he stands. On the other hand, it may only confuse him for a second or two.

Now, these zomby creatures have the uncanny talent of inflicting death merely by invading your space. Your best bet is elude them if you can, or have a protective spell or two handy. If you don't make it, your supply of life points will dwindle before your eyes.

Of course, if you do manage to locate one of the seven crowns, you'll be spirited off to the edge of the screen and transported to the next perilous chamber. The game is simply a joystick reflex contest; there are no mazes or puzzles to muddle or perplex. Still, it'll take practice to master and patience to mend.

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## Zork I: The Great Underground Empire

*Infocom*

**System Requirements:** 32K, disk

**Program Depth & Detail:** 9.0

**Support Availability:** 7.5

**Originality:** 8.5

**Video Design & Clarity:** 5.0

**Documentation:** 7.0

**Difficulty:** 9.5

**Price:** \$40

**The Great Underground Empire** is a classic prose adventure — one of the first and most popular products in the genre and a prototype for scores of successive “dungeons and dragons” episodes. As such, the game seems primitive by contemporary standards but continues to have appeal as one of the most involved and extensive adventure scenarios ever contrived for

microcomputers.

The **Zork** games generate point scores so that two or more can play. It's actually possible to win even if your character gets killed off prior to the quest's resolution.

The premise is the timeworn “Jason and the Golden Fleece” story, transposed to a different, even grubbier location in space and time. The game places you, the operator, in a subterranean

labyrinth in some dark and foggy land. Naturally, somewhere in a remote chamber waits a treasure. Typing in your actions, you must manipulate your computer "self" through the dungeon while contending with a miscellany of perils, secure the treasure, then deposit it (where else?) in a trophy case.

Well, I warned you that the game might seem crude by "modern" standards. The computer unfolds the plot based on the player's choice of actions. With each new chamber the vicarious quester enters, the player must type in a fresh action as simple as looking, taking, or leaving.

The more positive your behavior, the more points you accumulate. Get killed and you lose points, but you still might win.

Since this is an all-prose, no-

picture fantasy, the plot seems especially eery. With every frame, you become increasingly aware of the deathly silence. As with other Infocom adventures, you have an ample dictionary of commands the computer can interpret. In fact, **Zork** supports multiple-command statements that involve several different actions. You can instruct your alter ego to pick up an object, enter a cavern, and inspect the surroundings all in one sentence. As you proceed along through the unintelligible labyrinth you apparently become a more formidable opponent for the sundry perils hovering behind every cavern entrance.

No dungeon champion, new or experienced, can lay true claim to the title of master adventurer without weathering the **Zork** experience at least once.

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## Zork II: The Wizard of Frobozz

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*Infocom*

*System Requirements:* 32K, disk

*Program Depth & Detail:* 8.0

*Support Availability:* 8.0

*Originality:* 7.0

*Video Design & Clarity:* 6.0

*Documentation:* 7.5

*Difficulty:* 8.0

*Price:* \$40

Now, the Lord Dimwit Flathead the Excessive once had in his employ a certain magician, one Wizard of Frobozz, who as you may know, reigns over the underground labyrinth.

More treasures, unpredictable beings, and inscrutable chambers await you in this second episode. Both your life and your point score may depend on typing in the right "Interlogic" command.

Some of your choices may be more obvious than others. When you stumble into an implement, it's not a bad idea to get, seize, or take it. On the other hand, it might also spell your demise.

**Wizard of Frobozz** is an adventure continuation but not an add-on module. You can puzzle over it quite nicely without ever having seen, played, or run **Zork I**.

The action begins in the exact spot where the weary adventurer came to rest in the final scenario of "The Underground Empire." Needless to say, how can you hang around without pressing on until you've finally won the title of Master of the realm? Along the way, it might pay to gather up the fresh cache of treasures lying about.

As with the first episode in this arduous trilogy, you'll encounter seemingly irresolvable puzzles that will probably require the counsel of one or more experienc-

ed Zorkist. The Infocom series is noteworthy in the intricate use of problem solving and vocabulary, with only a moderate sprinkling of macabre bloodshed. Nonetheless, your alter ego will probably suffer an untimely demise several times before you successfully reach the dragon and solve the final puzzle.

As if reacting to their own self-image, the authors have made the second episode of **Zork** even more bombastic than before. The overblown prose grates on the patience, but no doubt is intended to subtly disarm you against impending perils.

Somehow surviving and scarfing up all the treasure stored on disk will earn you the right to ponder over a final puzzle, pat yourself on the back, and decide whether to quit with your "Superior" rating or struggle on to **Zork III**.

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## Zork III: Dungeon Master

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Infocom

System Requirements: 32K, disk  
Program Depth & Detail: 8.0  
Support Availability: 8.0  
Originality: 8.5

Video Design & Clarity: 6.0  
Documentation: 7.5  
Difficulty: 9.0  
Price: \$40

At last: the ultimate test of your courage and cleverness. Here you are, still wandering around in the labyrinth with even greater perils

looming in the darkened caverns. But wait. With the endorsement of the **Dungeon Master**, you're sure to resolve the quest once and for

all. Or are you?

Part III is more lucid and intricate than either of its predecessors. This all-prose adventure is the denouement to the granddaddy of modern "dungeons and dragons."

The staircase where your tattered alter ego was left standing at the fateful conclusion of **Zork II** is the convenient starting point for this even more cynical fantasy. However, you need not be familiar with, or have struggled through, the previous episodes to experience the immense perplexity and wry humor of this elaborate puzzle.

The prose scenario can be mapped out nicely into nearly 60 different environments. Attention to

detail is paramount. Using a fairly diverse syntax of simply stated commands, you attempt to maneuver your alter ego in solution of the puzzles.

Naturally, you're also out to seize and horde as much treasure as you can find. Fortunately, there's an amplitude to find. In the end, should you succeed, you'll be surrounded by heaps of dazzling lucre and even rewarded with stock in the Frobozzco megacorporation.

**Zork III** is the most challenging of the series and also the most unrestrained in its wry use of largely irrelevant humor. Milder in tone but richer in detail, this episode is a fitting conclusion to a thoroughly trying trilogy.

## **Graphics, Languages, and Utilities**

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*“We must consider this thing in relation to its cause and in connection with its effects, not merely in the context of the pleasure we derive from it . . .”*

*Count Leo Tolstoy*



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## About Utilities

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No matter what your model or system configuration, your Atari computer is designed to do a lot more than bang bits and crunch numbers. Given the right software, your computer can draw pictures, generate graphs, develop entire video scenarios. With a communications program, your home computer can receive and transmit data over the phone lines; a terminal emulation package will even let you "speak" with larger computer systems. With a language interpreter, assembler, or compiler, you can bang your own bits to sculpt custom programs. Other utilities help you manage your diskettes or recover data from damaged media.

Numbered in this category are at least a handful of products you can ill afford to ignore.

### **Graphics Generators**

You'll find three general classes of graphics programs. Business graphics software is designed strictly to produce graphs, charts, and simple diagrams in illustration of numeric data. More powerful "screen generators" give you total creative power over graphic content, from artistic depictions to animated sequences. Another class of graphics programs is targeted to children, using artistic expression as a

premise for learning elementary concepts of computing.

Be clear on the specific capabilities and traits of any contemplated graphics program. If your application is bar graphs for the annual report, you'll find a full-fledged screen painter too complex and unwieldy. On the other hand, if you're looking for an animation utility for games you'd like to write yourself, a scatter point graph won't exactly fit the bill.

### **Communications Software**

One of the most useful things a personal computer can do is communicate over the phone lines to other computers. A good modem program will automatically dial the destination phone number, store your frequently used numbers, and provide for variable transmission rates. At a minimum, you should be able to send and receive at 300 or 1200 bits per second — the conventions for low and high performance modems. The better programs let you set the parity, word structure, number of stop bits, and duplex of data transmission to accommodate a broad spectrum of remote computers.

Some programs will allow you to receive data, but not save it on diskette. If you need to permanently retain information received from a remote installation, look for a program that can "capture" as well as "communicate."

A terminal emulator will extend your computer's communication powers even further. By fooling a host computer into thinking your computer is a commercial-grade video display terminal, a terminal emulation program actually permits you to operate the computer at the other end of the line.

### **Languages**

Programming languages are supplied in three forms: interpreters, compilers, and assemblers. A "high level" language actually represents the lowest level of performance. On the other hand, who cares to write programs in the abstract machine code that a computer chip understands? With a high level language, you use relatively simple, mnemonic instructions like "PRINT, DO, GOTO." You can also program calculations using standard arithmetic operators (+, -, \*, /). Unfortunately, no computer "brain" thinks in such "high level" terms. The machine only understands a strictly numeric instruction set reduced to minuscule events.

An "interpreter" translates a high level program a human can comprehend into an object code the computer can understand. The translation occurs one line at a time — as you can visualize, a fairly methodical process that's something less than lightning-quick. A "compiler" also translates personable high level programs into machine code, but

all at once. Actually, you must first write the program with a text editor, then compile it to produce the translation. It's the compiled "object file" that the computer uses to execute the program.

Assembly languages require more steps but execute more quickly than high level programs. In BASIC, you add two figures by writing "A + B." In an assembly language, you might have to use twenty different instructions to fetch a number from memory,

load a register, fetch the second number, load another register, add the contents of the two registers, and place the result in a third register.

Besides speed of execution, you should also evaluate debugging capabilities. Some compilers will summarize the number of syntax errors without telling you what they are. The best products at least give you a code indicating how you've violated the sanctity of the dialect.

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## **Atari Graphics and Sound**

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**AtariArtist**

Atari

**System Requirements:** 32K, cartridge; Atari Touch Tablet  
**Ease of Implementation:** 8.0  
**Program Depth & Detail:** 8.0  
**Value for Your Money:** 8.5  
**Support Availability:** 8.5

**User Sophistication:** Begin.  
**Video Design & Clarity:** 9.0  
**Overall Efficiency:** 8.5  
**Documentation:** 8.0  
**Price:** \$100

**AtariArtist** is an exceptional graphics program designed specifically for use with the new Atari Touch Tablet. This program offers outstanding responsiveness and virtually freeform design capability — two hallmarks of digitized drawing — but also an integral library of pre-designed shapes and effects. In effect, **AtariArtist** combines the advantages of both a digital pad and a drawing program in a single, icon-oriented medium.

Before this review becomes too obtuse, let's digress to define a few terms. The Touch Tablet is a "high-resolution digitizer," commonly dubbed a digital pad. Pressure on the surface of the pad sends a code to the computer to display a graphics character in a corresponding section of the monitor. By tracing a pattern with a stylus, you create an identical rendering on the screen, with coloration and special effects controlled by the computer. The Atari Touch Tablet has a button built into the stylus to transmit a "control" signal, in a fashion similar to the button on a joystick or graphics mouse. A "drawing program" relies on static, pre-designed patterns that

can be selected and arranged in combination to form various shapes and textures. The term "icon" refers to the use of symbols rather than words to indicate command options in a menu.

**AtariArtist** uses icons to depict its numerous operations. You have the option of drawing "freehand" using the stylus as a "pen" and the Touch Tablet as your "paper," or choosing from the gallery of shapes. The selection includes boxes, circles, frames, and circular rays. In the "draw" mode, the size of the stroke can be varied. The Color Menu can generate as many as 128 different colors.

The program also includes several advanced graphics features for refining and testing pictures during their development. You can "magnify" any portion of the image for detail work, or flip the design with a "mirror" function.

Color graphics has always been one of Atari's greatest untapped potentials. The early "video palette" program was a dazzling testimony to the computer's artistic powers. Ambitious in scope and elaborate in detail, **AtariArtist** is unquestionably the most

complete graphics program marketed for Atari computers — quite possibly, the most versatile

artist's product available for any microcomputer on the market.

## Delta Drawing

*Spinnaker*

*System Requirements:* 32K, disk or cartridge  
*Ease of Implementation:* 9.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

This vivid graphics tool for early learners is nice and easy, but capable of prolonging the child's attention for extended periods. The program draws brightly colored pictures on the monitor in response to simple key commands. "D" starts the computer drawing, and "L" turns the cursor to the left. Press "E" and the drawing is erased. It's not a terribly hard — or efficient — way to create a recognizable composition, but it is easy.

Since every tiny fragment requires a separate keystroke, allot plenty of time for the child to ex-

*User Sophistication:* Begin.  
*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$60

periment. The color of the electronic crayon can be changed at any time. You can also add text directly from the keyboard.

The program saves the drawings and re-displays them whenever you like. The technique is unwieldy, so don't expect "Guernica" the first time around. In fact, if you fancy abstract expressionism or op-art, you'll be happier with the results. When you finally get around to turning the program over to your kids, they'll love just about anything they create.

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## Drawit

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APX

*System Requirements:* 16K, disk or cassette  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.0  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.0  
*Price:* \$40

This program turns your animated drawing into a slide show with controlled timing and automatic message cycling.

To create your masterpieces, you control four "color pens" with a palette of sixteen colors and eight hues. You can "sketch" freehand-style or select from a repertoire of shapes, including circles and boxes, filling your contours with solid color.

You can edit your pictures to move shapes to different portions of the screen, alter the coloration, or merge two separate picture files together to form an overlay. In addition, the program has a "Zoom" feature for enlarging any designated portion in one of two selectable magnifications.

Your creations can be linked to your BASIC programs for incorporation in a routine. Using a "lap dissolve" function, you can simulate animation with several sequential pictures. Sketch a robot with hands held high in one frame, then reproduce the character in a second picture with hands at his side. When you dissolve from one picture to the next, your creation will appear to be doing a jumping jack.

The software is supplied with a brief instruction booklet and a demonstration of the animation technique. The program is not as simple to operate as its producers might claim. Perseverance, repetitive practice, and attention to detail are essential.

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## Koalapad Microllustrator

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Koala Pad

*System Requirements:* 48K, disk, Koalapad  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.5

*User Sophistication:* Begin.  
*Video Design & Clarity:* 10  
*Overall Efficiency:* 9.5  
*Documentation:* 8.0  
*Price:* \$150

Seurat, the post-Impressionist master of "Pointalism," would have taken quite nicely to this superb drawing tool — as no doubt would Mondrian and Klee, the geniuses of geometric abstraction.

The computer's graphics qualities and the limitations of the monitor dictate the scope of any artistic endeavor you might attempt with your computer. The trick is not to ignore the obvious drawbacks of the medium, but rather to work within them — cultivate and direct them — to mold their particularly geometric attributes into a visual poetry distinct from the rigid patterns from which the impressions are formed. It is important to remember that the "objective" of art is not necessarily to replicate the visual perception of nature but rather to evoke new sentiments and provoke new thoughts.

Viewed in this context, **MicroIllustrator** must be considered the most sensitive artistic instrument available for the Atari. Keyboard-driven or joystick-manipulated graphics software is fine as far as it goes, but this program offers free manual control over the visual representation of concepts; and, after all, the very word "art" implies dexterity as much as intellect.

The key word here is "free." **MicroIllustrator** relies on input produced by a plug-in graphics

tablet called the Koala Pad (in the vernacular of the bit banger — a "high resolution digitizer"). The software translates impressions from the digital pad into on-screen designs; the process is the closest thing to "drawing" with a computer that's physically possible within the confines of the current technology.

The artist creates a drawing on the monitor screen by directing pressure and motion on the vinyl surface of the Koala Pad. Any tactile instrument will produce impressions on the monitor: a skillful finger for "soft" lines or a rigid stylus for "hard-edge" drawings.

A talented artist will take to the medium instantly with little or no adaptation. A practiced draftsman may have more difficulty adjusting to the often unpredictable effects of the Koala Pad. Imagination, ingenuity, and the spirit of experimentation are the only syntax required.

The artist can save any picture on diskette, retrieve it for modification, then resave the new image without destroying the original.

We highly recommend this product, not only for its pre-eminent graphic qualities, but for its educational and cultural values as well. It can entertain a child as profoundly as any galactic target game, yet do far more to exercise the perceptive, interpretive, and constructive skills of a developing mind. In the hands of a thinking

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adult, this software is a dazzling medium for creative expression with all the color, impact, and

rigor of the Age of Imagination in which we live.

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## Player Maker

APX

*System Requirements:* 48K, disk; joystick  
*Ease of Implementation:* 7.0  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 7.5  
*Support Availability:* 9.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* Quoted by Vendor

Create your own monsters, aliens, or robot-men with **Player Maker**, a programmer's utility that enables even the novice programmer to invent Player-Missile Graphics.

Designed for children seven to adult and beginning programmers to those more experienced, the directions in this program are simple and fun. Starting with a block or blank screen and using the joystick and screen prompts, design your player, pixel by pixel.

You have the facility to define the shape of four different characters and view them in different resolutions, widths, and colors — two at a time.

**Screen Maker** turns the finished design into a subroutine that can be used in any BASIC program you have written. In conjunction with **Screen Maker** you have a simple way to experiment with graphics and animation and include them in your own game play.

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## Screen Maker

APX

*System Requirements:* 48K, disk; joystick  
*Ease of Implementation:* 7.5  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 7.5  
*Support Availability:* 9.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* Quoted by Vendor

A handy BASIC programming tool, **Screen Maker** helps the programmer combine text and graphics without the cumbersome manipulation of BASIC programming statements.

Using a joystick, all you need to do is design the screen display of your choice following simple screen prompts. **Screen Maker**

turns your design into a subroutine that can be used in any program you like.

**Screen Maker** is capable of combining up to fifteen different graphic modes simultaneously. It is a programmers utility program that becomes a valuable asset in creating combinations of graphic and text modes quickly and easily.

## SynTrend

*Synapse*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$100

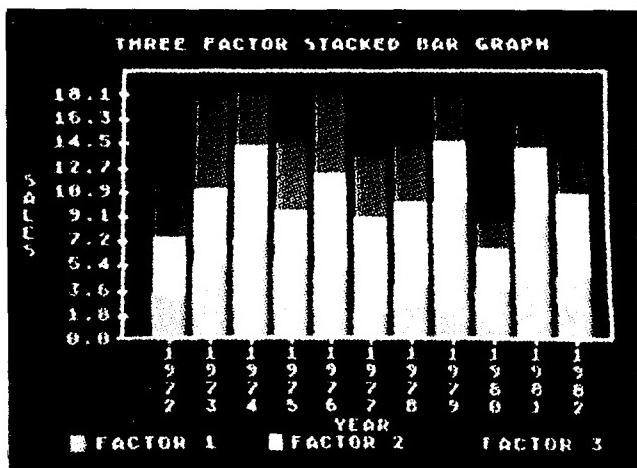
This vivid plotting tool takes maximum advantage of the Atari's integral graphics capabilities, generating professional-quality, highly detail-

ed graphs based on descriptive statistics or multilinear regression analysis.

The program accepts both keyboard entries and data supplied by a DIF-compatible spreadsheet program (e.g., VisiCalc).

**SynTrend** quickly computes trend factors from periodic sets of data — for instance, a set of monthly stock prices — and uses them to plot interpretive charts in full color on the monitor screen. The repertoire includes pie charts, bar graphs, and scatter point graphs.

Any **SynTrend** graphic can be stored on disk for future reference.



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## Video Easel

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*Atari***System Requirements:** 16K, cartridge**Ease of Implementation:** 7.5**Program Depth & Detail:** 6.0**Value for Your Money:** 6.5**Support Availability:** 9.0**User Sophistication:** Begin.**Video Design & Clarity:** 7.0**Overall Efficiency:** 7.0**Documentation:** 8.0**Price:** \$35

**Video Easel** was the first Atari artist's program on the market — and one of the first such programs available for any micro-computer. Though it may seem stark in comparison with the newer breed of graphics facilities, it continues to have strong appeal for its dazzling images and relative affordability. The program is supplied on cartridge and does not require any additional hardware.

The package contains two drawing modes, a preprogrammed painting mode and a colorful version of the classical computer game of "Life". The painting mode generates six individual kaleidescope patterns.

The "Draw" function lets you sketch images by manipulating the cursor on the monitor screen. As you depress the joystick button, the cursor lays down a solid

line. Unfortunately, you have no control over coloration. A "Quad" drawing facility produces the same effect, but with four symmetrical lines.

The game of "Life" is not only a vivid graphic demonstration, but also a simulation of cellular growth and evolution based on a series of postulates about survival and replication. Create any simple design, and the computer will construct a dazzling graphic following the "rules of growth." The effect is intriguing.

**Video Easel** is a mainstay among Atari artists. It's a demanding tool that requires considerable drafting skill and above average design awareness. It should not be overlooked that this program is responsible for some of the most striking artistic endeavors generated by computer.



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**Languages:**  
Interpreters, Assemblers and Compilers

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## ATARI Logo

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*Atari Inc.*

*System Requirements:* 16K, cartridge  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 9.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 9.0  
*Overall Efficiency:* 8.5  
*Documentation:* 9.5  
*Price:* Quoted by Vendor

Designed with elementary school students in mind, Logo is a great beginner language for any age group, featuring simple English phrases for commands, "Turtle" graphics, and a programming framework that allows the programmer to structure his or her own learning process.

FORWARD, BACK, RIGHT, and LEFT command a turtle to do just that and programming with these four statements teaches children concepts in spatial orientation, direction, estimation, and angles. The monitor screen is divided into four quadrants so that older students learn degrees with instructions such as RIGHT 45 or LEFT 90. "What size of a turn will make a square? — or a hex-

agon?" The command TO with a name enables children to write procedures that can be used again, stored, or combined with other procedures which in turn make another one. The possibilities are limitless.

**ATARI Logo** excels in a broad range of colors and high resolution graphics. For simple experimentation there is little need for more than just the cartridge and color monitor. Books, guides, and magazines on Logo for youngsters are widely available to facilitate the implementation of classroom Logo programs for kindergarteners on up.

**ATARI Logo** is likely to become the indispensable core of many school computer labs.

## ATARI MicroSoft BASIC II

*Atari Inc.*

*System Requirements:* 16K, cartridge and extension diskette

*Ease of Implementation:* 8.5

*Program Depth & Detail:* 8.5

*Value for Your Money:* 8.0

*Support Availability:* 8.0

*User Sophistication:* Exp.

*Video Design & Clarity:* 8.5

*Overall Efficiency:* 8.0

*Documentation:* 8.0

*Price:* Quoted by Vendor

Teachers and students interested in advanced software development will appreciate the special capabilities and features of **ATARI MicroSoft BASIC II**.

Faster than ATARI BASIC, this versatile cartridge version offers additional powerful commands and floating point precision to sixteen digits. Strings can be set up at any point in a program without dimensioning them

at the start. Handy editing features include an automatic line renumbering command and error messages written in plain English. Errors are described only in the RUN mode, the advantage being less interruptions during program development.

**ATARI MicroSoft BASIC II** is recommended for those who have already mastered the concepts of BASIC programming.

## ATARI Pascal (Version 2.0)

*Atari Inc.*

*System Requirements:* 48K, two disk drives

*Ease of Implementation:* 7.5

*Program Depth & Detail:* 9.0

*Value for Your Money:* 7.5

*Support Availability:* 8.0

*User Sophistication:* Exp.

*Video Design & Clarity:* 8.5

*Overall Efficiency:* 7.5

*Documentation:* 8.5

*Price:* Quoted by Vendor

Designed in answer to the need for structure and standardization in programming languages, Pascal has gained widespread acceptance, especially in the academic environment. Pascal is frequently taught as the primary high level language requirement

in computer science curricula; moreover, entry level comprehension is tested in the College Board Placement Exam for computer science.

Similar to MT + Pascal, ATARI Pascal exceeds the International Standards Organization

draft proposal for Pascal standards. Special features accommodate Atari sound, graphic, and game control capabilities.

Recommended for children age nine to adult, Pascal is a menu-driven language that does away with sloppy "goto" programming practices while requiring

adherence to organization and structure.

This Pascal set contains an adequate complement of development tools, including both an editor and linker, but is especially geared toward tutorial applications.

## ATARI Pilot

*Atari Inc.*

*System Requirements:* 16K, cartridge

*Ease of Implementation:* 8.5

*Program Depth & Detail:* 9.0

*Value for Your Money:* 9.0

*Support Availability:* 8.0

*User Sophistication:* Begin.

*Video Design & Clarity:* 9.0

*Overall Efficiency:* 9.0

*Documentation:* 9.5

*Price:* Quoted by Vendor

**ATARI Pilot** provides children and adults with the opportunity to learn programming concepts and techniques using commands that make sense in ordinary English. Tell the computer to TYPE, JUMP, MATCH, DRAW, or TURN and it does just that — or something reasonably close. A beginner is quick to begin his own programs, utilizing entry level logic concepts in a unique learning environment.

Regardless of its simplicity **ATARI Pilot** contains powerful

capabilities in an educational framework. Using "Turtle" graphics, programmers create complex and intricate designs, in the process developing and reinforcing mathematical skills involving angles, distance, estimation, shape, and spatial orientation. Advanced "pilots" create their own animated educational games.

**ATARI Pilot** is an indispensable program in the elementary and secondary computer lab.

## **ATARI Super PILOT**

APX

*System Requirements:* 48K, disk; ATARI PILOT  
*Ease of Implementation:* 8.5  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 9.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.5  
*Price:* Quoted by Vendor

**ATARI Super PILOT** extends the capabilities of **ATARI PILOT**, the people-oriented computer language widely used in the educational field.

Once you have mastered **ATARI PILOT** you will be delighted with the additional features of this sequel program. Particularly impressive in the area of graphics and sound, **Super PILOT** offers access to three sizes of graphic letter fonts all on the same screen display. Both your choice of color and sound notation are much larger in this version. **Super PILOT** gives you access to all eight of the

ATARI graphic modes.

Special programming features let you trace, break and continue, or revise any part of your program for greater ease of implementation. Additional commands such as LOAD, MERGE, and APPEND are well suited to the instruction of modular programming.

Recommended for fourth graders to adult, it would be sensible to offer students a sufficient amount of time exploring the learning dimensions of **ATARI PILOT** before introducing them to interesting extra features of **ATARI Super PILOT**.

## **BASIC Compiler**

Datasoft

*System Requirements:* 48K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 9.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 9.0  
*Documentation:* 8.0  
*Price:* \$80

This efficient compiler for BASIC enthusiasts has the combined advantage of machine language execution speed and the

mnemonic simplicity of the Beginner's All-Purpose Symbolic Instruction Code.

Of the conventional means of

executing BASIC program listings, compilers by far outweigh the competition. A simple interpreter reads and executes each BASIC instruction one at a time, whereas a compiler translates the entire program into machine code for lightning-quick execution.

The Datasoft compiler is a competent compiler with a limited number of programmer utilities. Technically, this product is what's known as a "four-pass" compiler, because it takes four separate passes at the program before it finishes creating a machine-compatible file.

The first pass reads the programmer's listing written in BASIC syntax and translates it into intermediate files represented in assembly language. The re-

maining passes are performed by a built-in assembler that reduce the intermediate files into machine code. It's this terminal, machine language file that's executed when the compiler runs the program. The module that has no other function than to execute a program file in machine code is called the system "Run Time."

Because all these passes and executions are required to accurately compile and debug even the simplest BASIC routine, all the files are stored on the disk as the passes are completed. Thus, to edit a program, you must not only rewrite the BASIC listing, but you'll also have to generate new intermediate file and destination code.

## Deep Blue C

Atari

*System Requirements:* 48K, disk  
*Ease of Implementation:* 7.5  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.5

*User Sophistication:* Exp.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$40

**Deep Blue C** is Atari's officially sanctioned compiler for the "C" language. The elegant syntax and logical design of "C" have made this once-hypothetical "programmer's panacea" into a de facto standard among system developers. It's a language used

extensively with minicomputer applications for extensive number crunching chores. In fact, "C" is the heart of the UNIX operating system utilized in sophisticated multi-user systems worldwide.

This friendly compiler supports most high-level structures of the

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language and adheres closely to the transportable "standard." Unfortunately, this product does not contain a built-in text editor, so you'll have to use an extraneous editing facility to write programs or edit source listings. The recommended supplement is the "Atari Program-Text Editor," a simple, full-screen editor suitable for programming chores.

You can't use **Deep Blue** to compile other "C" source pro-

grams written for different systems. You'll still have to print a listing and re-enter it with your text editor, before you'll have much success with the compilation.

Though lacking the programmer's conveniences usually associated with a compiler package, **Deep Blue** is a decent tool for beginning and intermediate "C" enthusiasts. We recommend it for writing original programs, but not for attempting to run existing application software.

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## Edit 6502

LJK

<i>System Requirements:</i>	16K	<i>User Sophistication:</i>	Adv.
<i>Ease of Implementation:</i>	8.0	<i>Video Design &amp; Clarity:</i>	8.0
<i>Program Depth &amp; Detail:</i>	8.0	<i>Overall Efficiency:</i>	8.5
<i>Value for Your Money:</i>	8.0	<i>Documentation:</i>	8.0
<i>Support Availability:</i>	8.5	<i>Price:</i>	\$200

This cartridge-based assembler/editor package offers a comprehensive set of development tools for 6502 programming for the user making his first plunge into assembly language.

The built-in line editor operates in a fashion similar to an interpreter; it's not a full-screen editor that permits wholesale revision with simple keyboard commands. Instead, you must correct instructions line by line.

The editor and assembler are

held in RAM simultaneously — a particular convenience for testing your program as you create and edit. The object file can be stored on disk for safekeeping, then reloaded when required.

Beginning programmers will find the debugger adequate for most applications. A "Trace" facility will display each line of the program listing one by one as the object file is executed, allowing you to examine your programming logic in context.

## Synassembler

### Synapse

*System Requirements:* 16K, disk or cartridge  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.0  
*Support Availability:* 8.5

*User Sophistication:* Adv.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$50

This 6502 assembler is designed for Atari users who have a decent background in high-level programming and are undertaking assembly language for the first time. In fact, this product's most appealing trait is its friendly choice of mnemonics.

The software relies on the built-in Atari screen editor for creating and editing program listings. The assembler provides a standard set of features, including local labels and symbol table sorting. It is not a particularly fast or powerful program; sophistication has been sacrificed in the interest of tutorial simplicity.

The debugging facility includes a useful "trace" feature for analyzing an assembled program line by line during a trial run. A built-in hexadecimal-to-decimal conversion utility will also convenience the novice.

Users familiar with Apple assembly concepts will recognize this product as an adaptation of LJK's 6502 assembler for the Apple II family. Its popularity is undoubtably based on a structural and syntactical similarity to high level languages like BASIC and Fortran.

## MAE

### Eastern Software

*System Requirements:* 16K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 7.5

*User Sophistication:* Adv.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.5  
*Documentation:* 7.5  
*Price:* \$175

This 6502 assembler for Atari systems provides fast processing speed and a built-in text editor —

two hallmarks of value in a macroassembler. Program listings created with the full-screen editor

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are translated into relocatable object code for permanent storage.

This system provides a full complement of debugging procedures for rectifying errors trapped by the machine language monitor. However, you'll find the going slow, owing primarily to lack of a "trace" facility for

analyzing program logic one step at a time.

As is too typical of Atari software, most of the pseudo-ops are incompatible with other 6502 assemblers. Still, **MAE** is a reasonably competent macro with good execution speed.

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## **System Utilities**

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## Atari Program - Text Editor

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Atari

**System Requirements:** 32K, disk; Atari BASIC  
**Ease of Implementation:** 6.5  
**Program Depth & Detail:** 7.5  
**Value for Your Money:** 6.0  
**Support Availability:** 8.5

**User Sophistication:** Exp.  
**Video Design & Clarity:** 7.0  
**Overall Efficiency:** 5.0  
**Documentation:** 7.5  
**Price:** \$40

This simple screen editor is designed for loading and editing program listings. It's suitable for both original programming applications and debugging or modification of existing ("source") programs.

The Atari **Program Editor** is competent enough for most programming chores, but too cumbersome for typical document applications. However, it does offer the power and convenience of full-screen cursor movement and freeform editing. There are a few word processor-like features that definitely streamline the otherwise arduous task of re-working extensive program lists.

You can scroll, insert, and delete with simple key commands, just as you would with a word processor. You can also set the format for automatic indentation when you need it.

This program also supports line-oriented commands for editing buffer files (characters

held temporarily in RAM). You'll also find an efficient global research operation for quickly locating specified or recurring strings.

When you need to move or copy entire subroutines, you can manipulate text blocks using a simple "marker" system. Merely place a marker at the beginning and end of the desired text, then copy or move it to any designated spot in the file with a simple command option.

The editor cannot format text files for hard copy output. However, in conjunction with a formatter (e.g., Atari's "Text Formatter"), the program can be used for light correspondence applications. We heartily recommend this product to Atari programmers in need of a full-screen editing facility for entering, revising, and debugging listings in BASIC, Pascal, Fortran, or 6502 Assembly language.

## Chameleon

Atari

*System Requirements:* 16K, cassette; 24K, disk; modem; interface module  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 9.0  
*Support Availability:* 8.5

*User Sophistication:* Exp.  
*Video Design & Clarity:* 8.5  
*Overall Efficiency:* 8.5  
*Documentation:* 8.0  
*Price:* \$25

**Chameleon** is a terminal emulator designed to fool host computers into thinking your Atari is a commercial-grade video display terminal. The program can also be used to transmit and receive data over the phone lines using an Atari 830 acoustic coupler. With an RS 232 cable, you can communicate with another microcomputer that accepts the codes from one of the three VDTs supported by this elegant communications package.

Ostensibly, **Chameleon** is code-compatible with Lear Siegler ADM 3A terminal, the DEC VT 52 console, or the Glass TTY. However, the emulation is far from complete; owing to limitations of both your Atari hardware and the program's own design, this product does not support the full complement of codes you'll need to use much of the application software found on a commercial computer system. However, there is enough compatibility to access many programs, manipulate data, and

capture transmissions from remote CPUs.

To mimick the VDT screen, **Chameleon** breaks the 80 column display into two 40-column segments (the maximum Atari can handle intelligibly). To access the full screen width, you can scroll horizontally left and right.

Besides terminal codes, both the transmitting and receiving systems must have compatible transfer speeds and parity (an error checking convention). The program offers transmission speeds from 75 to 9600 bits per second (to determine the number of characters per second, divide the number of bits per second by eight).

To capture data you receive from a teletransmission, the contents of the screen can be output to the printer for hard copy. The source code is provided free of charge, so if you're knowledgeable in the 6502 assembler and familiar with terminal ASCII codes, you can modify the **Chameleon** to mimick other VDTs.

**DDT***Atari*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 7.5  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.5

*User Sophistication:* Exp.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$40

**DDT**, "Dunion's Debugging Tool," is designed as a companion module for Atari's Program-Text Editor and MacroAssembler. As such, it's not a self-sufficient debugger, but rather an add-on facility designed specifically to locate and display problem areas of a program listing.

The best thing about **DDT** is its

tidy display. Separate "windows" depict the contents of the CPU registers, memory addresses, and the system stack. The monitor also displays a table of user-defined mnemonics and break points.

The disk is supplied with a set of examples for learning and practice.

**DiskAssembler***Artworx*

*System Requirements:* 32K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.5  
*Value for Your Money:* 8.5  
*Support Availability:* 8.5

*User Sophistication:* Exp.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$30

Well conceived and aptly named, **DiskAssembler** is a disk-oriented disassembly tool for analyzing programs, debugging, and recovering data.

The program is menu driven for ease of use by novices, but few operators will be able to apply the software meaningfully without a background in disk I/O technology and assembly language programming.

**DiskAssembler** first of all

analyzes a diskette sector by sector. It can report on the contents and permit editing of the data stored in each sector. Secondly, the program is a disassembler that decodes the information and visualizes it in assembly language for inspection. Third, it maps the contents of a disk for reference.

Because it's disk-oriented, this product does not require you to load each file into RAM one by one before disassembly.

## Diskey

*Adventure International*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 7.5

*User Sophistication:* Adv.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$50

This program equips Atari users and programmers with a tool for recovering data from damaged diskettes.

The program reads and analyzes the contents of a disk, recovers damaged files, and reports on unusable sectors.

This product also includes a set of utilities for restoring crashed disks by reconstructing the salvageable sectors of a diskette while ignoring the unreadable ones.

A detailed user's manual provides an elementary primer on diskette concepts, disk I/O procedures, and operation of the

program. A technical glossary helps fill in gaps in the user's functional Computerese.

This routine is a built-in utility with some computer operating systems, but is not a standard software component for Atari systems. This is a virtually indispensable product for disk-based systems. Like a light bulb, magnetic media are guaranteed to wear out, and 5 1/4" floppy disks are especially volatile. This program's purchase price will be quickly recouped with the first important file you recover from an otherwise unreadable disk.

## Hex-a-Bug

*Atari*

*System Requirements:* 48K, disk  
*Ease of Implementation:* 7.5  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.5

*User Sophistication:* Exp.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 7.5  
*Price:* \$40

**Hex-a-Bug** is an efficient, screen-oriented debugging tool that depicts the contents of RAM and the CPU registers. The program permits contiguous viewing

of your program's execution and the memory/register values to aid in identifying programming problems in context.

The display is divided into

horizontal bars, each depicting a separate stage of the program. Within these strips, you can freely edit data to view the impact. You can scroll forward or backward to change the contents of the bars.

This vivid analytical tool is more an add-on utility than a standalone program. A sophisti-

cated assembler should be expected to contain this kind of facility as an integral component, but in the Atari development scheme, you'll need to purchase it separately. **Hex-a-Bug** is a good visualization medium for programmers with limited ability to focus on peripheral events.

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## Screen Dump Utility

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*Atari*

*System Requirements:* 24K, disk

*Ease of Implementation:* 7.5

*Program Depth & Detail:* 7.5

*Value for Your Money:* 7.5

*Support Availability:* 8.5

*User Sophistication:* Begin.

*Video Design & Clarity:* 8.0

*Overall Efficiency:* 8.0

*Documentation:* 6.5

*Price:* \$16

Atari's **Screen Dump** utility permits the entire contents of the monitor to be "dumped" to your printer for hard copy reproduction. This program is designed for concurrent use with existing application software, but can also be used to capture data received via modem from a remote network or system.

The beauty of the program is its standalone simplicity. Once you've loaded the utility, you can print any screen anytime you like. You must boot **Screen Dump** before you run any other pro-

gram; it must operate concurrently in RAM along with any other application program you want to use. To transfer a screen to the printer, simply depress the CTRL key and type "P". Instantly, your printer will begin replicating the current contents of the screen.

**Screen Dump** is designed to operate with graphics printers utilizing Centronics codes. According to the producers, the program will not produce satisfactory results with any other hardware (with the sole exception of the Atari thermal printer).

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## SynComm

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Synapse

*System Requirements:* 48K, disk  
*Ease of Implementation:* 8.0  
*Program Depth & Detail:* 8.0  
*Value for Your Money:* 8.5  
*Support Availability:* 8.0

*User Sophistication:* Begin.  
*Video Design & Clarity:* 8.0  
*Overall Efficiency:* 8.0  
*Documentation:* 8.5  
*Price:* \$50

**SynComm** is a simple, user-friendly communications package for Atari computers. The program communicates via a serial (RS232) port on the Atari interface module, providing access to public information networks or electronics bulletin boards. An Atari modem is also required.

The computer supplies easily understood prompts for con-

figuration and logging onto the system. Besides public access systems, **SynComm** also enables communication with other computers over conventional telephone lines.

Though this program enables receipt and transmission, it is not a terminal emulator — meaning that you can't send commands for execution by the host computer.

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## **Appendix**

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## Public Domain Software

There are two reasons Atari continues to rank among the world leaders in computer manufacturing and sales. For one thing, Atari home computers have exceptionally good price-to-performance relationships. Secondly, they're designed specifically for home and family use, with outstanding graphics capabilities, integral sound components, and built-in expansion interfaces that other computer companies often market as costly add-ons. Importantly, Atari computers are friendly and unin-timidating; consider that most users write at least some of their own software.

In fact, most of the software marketed today for Atari machines is authored by Atari users. As a result, several hun-

dred products have emerged in only the last three years. Still more are in the public domain for free access by anyone who can find them.

Virtually every local Atari user's group or computer club has a catalog of free software. A second source consists of electronic "bulletin boards" that can be accessed by modem. Of course, the cost of long-distance phone transmission can rapidly equal or exceed the cost of some commercial software.

The following list includes a representative cross section of programs currently in the public domain. In most cases, there is no definitive "source;" each is common enough to be found in a club library, user's group catalog, or local bulletin board system.

### Word Processing

**TEXT WRITE**

Line-oriented text editor.

**TEXT READ**

Loads and displays text files.

**TEXT PRINT**

Formats text files for printing.

### Decision Support

**BUDGET**

Customizable budgeting program with flexible accounts.

**BUDGET PLOT**

Graphing program for contrasting budget vs. actual expenses.

**CHECKBOOK**

Electronic check register that prints checks.

**DEPRECIATION**

Computes depreciation on fixed assets.

**INTEREST**

Calculates interest on specified loans and terms.

**LOAN**

Mortgage calculator with amortization.

**LOAN INTEREST**

A set of interest formulas for analyzing a prospective loan.

**Data Base**

**DATABASE**  
**FILE MANAGER**  
**MAIL LIST**

Customizable card file manager and query system.  
Flexible data base manager for random access retrieval.  
Dedicated filing program for mail list applications.

**General Business**

**CALENDAR**  
**LEDGER**

Prints a month-by-month calendar for any specified year.  
Fundamental ledger system with manual transactions.

**Education**

**ADDITION**  
**CAPITALS**  
**GEOGRAPHY**  
**HISTORY QUIZ**  
**MATH DIVISION**  
**MATH FLASH CARD**  
**MATH MULTIPLY**  
**METRIC**  
**READING**  
**SPELLING**  
**Typing**

Addition drill with sound effects.  
State geography drill.  
Geography tutorial in quiz form.  
World history exercise drill with random questions.  
Division drill with random problems.  
Electronic flash cards of variable difficulty.  
Multiplication drills.  
English to Metric conversion.  
Comprehension and speed exercises.  
Random spelling drill.  
Random exercise drill for beginning typists.

**Entertainment**

**ADVENTURE**  
**BACKGAMMON**  
**BASEBALL**  
**BASKETBALL**  
**BATTLESHIP**  
  
**BINGO**  
**BLACKJACK**  
  
**BOWLING**  
**BOXING**  
  
**BREAKOUT**  
**CASINO**  
**CHECKERS**  
  
**CHESS**  
**CRAPS**  
**DOMINOES**

Classic dungeons-and-dragons adventure fantasy, complete with caverns, perils, and treasures.  
Above average game of Backgammon.  
Text-based national pastime.  
All-prose slam dunk contest.  
Classic artillery game, based on hidden battleship coordinates.  
Random bingo card readout.  
A decent game of blackjack based on a randomly-generated deck.  
Not so entertaining bowling simulation.  
Player-controlled boxers battle it out in your mind's eye.  
(Pow! It's a right to the head!)  
Original brick-busting game based on video handball.  
Roulette, blackjack, and one-armed bandits.  
Your standard computer checkerboard challenge, but without kings.  
Chess referee for two.  
Computer-controlled dice game.  
Crude game of video dominoes.

<b>ELIZA</b>	Tongue-in-cheek computer therapist always willing to hear you out (Careful: the computer understands cusswords).
<b>FOOTBALL</b>	Text-based football game in which you call the plays according to collegiate rules.
<b>HANGMAN</b>	Guess the computer's secret word or hang by the neck until bored.
<b>HORSE RACE</b>	Computer-administered derby.
<b>JAILBREAK</b>	Classic Breakout game based on a variation of Atari Pong.
<b>LIFE</b>	Intriguing visual demonstration based on principles of biological proliferation.
<b>MAZE GENERATOR</b>	Random generator of maze puzzles.
<b>POKER</b>	Short-lived five-card draw.
<b>ROLL EM</b>	Automated dice for board games.
<b>ROULETTE</b>	Text-based roulette simulator with presumably random odds.
<b>RUBIC</b>	Cube puzzle simulation.
<b>SLOT MACHINE</b>	Simulated one arm bandit with random results.
<b>TIC TAC TOE</b>	Two-dimensional tic-tac-toe.

### **Graphics and Sound**

<b>BANNER</b>	Creates over-size text displays with gaudy characters.
<b>BAR GRAPH</b>	Generates business graphs.

### **Communications and Utilities**

<b>AUTO</b>	Loads and runs your custom programs automatically.
<b>CONV</b>	Converts binary files to ASCII.
<b>DEC-BIN</b>	Translates decimal notation to binary.
<b>DIAL</b>	Dangerous hacking tool for randomly accessing unknown computer lines.
<b>MODEM</b>	Indispensible modem control program for sending and receiving data by phone. As competent as any commercial product.



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## Public Domain Software Sources

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**Users' Groups**

Atari, Inc.  
60 E. Plumeria Dr.  
San Jose, CA 95134  
**(800) 538-8543**

**Bulletin Board Systems**

Atari BBS  
**(804) 491-1437**  
Atari 800 AURA  
**(314) 535-3799**

## Glossary

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- Abort** — Stop or cancel a procedure or program in progress.
- Access** — The ability to find data and/or store it in memory.
- Access Time** — Amount of time for data to become available after it has been summoned.
- Accumulator** — Register in the CPU where arithmetic operations are performed.
- Acoustic Coupler** — Device to convert computer signals into a series of audible tones for transmission through a standard telephone handset.
- ACK** — Acknowledge: A control signal verifying that a block of transmitted information has been successfully received.
- Acoustic Coupler** — Device, usually for a modem, used to transmit digital data over an ordinary telephone line.
- Alphanumeric** — Character set consisting of letters, numbers, punctuation marks, and symbols.
- ANSI** — American National Standard Institute, which sets industry-wide standards in numerous fields, including the computer industry.
- ALU** — Arithmetic Logic Unit, part of a CPU that performs mathematical operations.
- Applications Software** — Programs designed to do specific jobs such as inventory control or payroll processing.
- Assembler** — Program that translates assembly language into machine language.
- Assembly Language** — Abbreviated English commands, called mnemonic codes used to create program for assembly into machine code.
- Aspect Ratio** — In computer graphics, the ratio of the horizontal dimensions to vertical dimensions of a displayed image.
- Asynchronous** — A form of serial data transmission wherein information is sent in 11-bit segments with one start bit, eight data bits, and two stop bits to signal the end of the segment.
- Auto-Answer** — The ability of a modem to automatically answer an incoming telephone call.
- Backup** — Automatic duplication of files and programs to avoid accidental loss or damage of crucial data.
- Bar Code** — The identification code that appear on retail product packaging for entry into a data system by visual scanning.
- Bar Code Reader** — The stylus-like device for reading optical bar codes printed on product labels.
- BASIC** — Beginners All-Purpose Symbolic Instruction Codes. The simplest and most widely used high-level programming language for the microcomputer.
- Baud** — The measure of serial data transmission speed, expressed in bits per second (bps).
- Binary** — A base two number system used by digital computers.
- BIOS** — The basic input/output system; part of CP/M that manages data transmission between the CPU and its peripherals.

**Bit** — Binary Digit, the smallest amount of information a computer can use.

**Bit Banger** — Machine language programmer.

**Block Move** — The process of moving a block of data or text at one time.

**Bootstrap** — The procedure that loads a program, usually the operating system, into the computer's memory prior to use.

**BPS** — Bits per Second

**Bubble Memory** — A method for storing large amounts of data in a small space using minute pockets of magnetic current.

**Buffer** — A location for storing information temporarily during data transfer, both internal and external, compensating for differences in rates of data flow. The assigned part of memory used to hold data before it is stored.

**Bus** — The multi-wired communication line between the computer and its components.

**Byte** — Eight bits representing a computer "word" equivalent to a single ASCII character.

**Byte Basher** — Assembly language programmer.

**Call** — Program request for a specific action.

**Canned Program** — Preprogrammed, ready-to-use software for specific applications.

**Cancel** — Command to cancel or stop the procedure in progress.

**Card** — A printed circuit board.

**CBBS** — Computerized bulletin board service.

**Cell** — The location in a spreadsheet of a single entry, specified by axis coordinates; place in memory where a single unit of information is stored.

**Character Code** — The ASCII code assigned for each character.

**Character Pitch** — Printer setting designating the number of characters to be printed per horizontal inch.

**Character Printer** — Any printer that prints a single character at a time.

**Chip** — A slice of silicon bearing minute but intricate electronic circuits.

**Clock** — The timing mechanism used to synchronize the fetch cycle of a microprocessor.

**Cobol** — Common Business Oriented Language

**Code** — A symbol or character that a computer can understand.

**Compiler** — A language translator that converts the instructions in high level program to machine code.

**Computer Aided Instructions** — Highly structured, self-paced lessons administered by computer.

**Courseware** — A curriculum composed of computer-aided instructional programs.

**CP/M** — Control Program Monitor, a widely used microcomputer operating system for business and scientific applications. A registered trade mark of Digital Research, Inc.

**CPS** — Characters per second, a measure of printer output speed.

**CPU** — Central Processing Unit, the computer's "brain" where computations are performed and transmissions are orchestrated.

**Crash** — System shutdown; hardware or software failure.

**CRT** — Cathode Ray Tube or picture tube. Computer Remote Terminal.

**Cryptography** — Process of coding data to conceal its meaning.

**Cursor** — The small rectangle on the screen of a video terminal that points out the location of the next entry.

**Cursor Control Keys** — The special keys on the keyboard used for the changing direction of the cursor.

**Custom Software** — A program written specifically for an individual user to exact requirements.

**Daisy Wheel** — A printing element for letter-quality output.

**Data Base** — A pool of information organized by specified categories and accessible by set parameters.

**DBMS** — Data Base Management System, a program that can organize a data base by user-definable specifications.

**Debugging** — The detection and removal of program errors.

**Dedicated System** — Computer system or program with a single primary application.

**Default Value** — A value automatically supplied by the computer.

**DIP Switches** — Are a small series of on-off switches on a circuit board for altering hardware functions without modifying the equipment or circuitry.

**Direct Memory Access** — Direct transfer of data from a peripheral I/O device with memory so as not to tie up the computer's available processing capacity.

**Directory** — A list of all the files on a disk or other storage device.

**Disk Crash** — The failure of a disk causing the system to malfunction.

**Disk Drive** — The device that rotates magnetic disks and can access its data with read/write heads.

**Disk File** — A file stored on the magnetic disk.

**DMA** — Direct Memory Access.

**Documentation** — A set of instructions that accompanies hardware or software purchases, usually a User's Manual or tutorial.

**DOS** — Disk Operating System, or monitor, responsible for accessing and managing files or data stored on floppy or hard disk.

**Dot Matrix** — Printing method by which a series of pins creates legible characters in various combinations using a dot pattern.

**Double Density** — Magnetic storage device increased to twice its usual capacity.

**Download** — The transfer of programs or files from one computer to another computer, or from one medium to another.

**DownTime** — The time that a computer is not functioning as a result of mechanical failure or electrical problems.

**Driver** — A series of instructions the computer follows to standardize the format of data between the peripherals and the CPU.

**Dumb Terminal** — Video display terminal with no intelligence of its own.

**Dump** — The processes of copying data stored for backup purposes.

**Duplex** — A method of communication between two devices wherein data is sent to both devices at once.

**Electronic Bulletin Board** — A call-up service lets users compose and store messages to be retrieved by other users.

**Embedded Command** — A non-printing code placed in the body of a text document, usually to control printer function.

**Emulate** — Take on the characteristics of another system.

**ETX/ACK Protocol** — End Transmission/Acknowledge, a procedure used in communications to verify transmission.

**Execute** — The interpretation of a programmed instruction to perform the indicated operation.

**Fetch** — Retrieve data or instructions from storage.

**Fetch Cycle** — Process of retrieving an instruction from its address in memory, executing it, and returning to fetch the next successive instruction.

**File** — Data stored in a group on a diskette or other medium, accessible by a designated name.

**Filename Extension** — An abbreviation, usually three characters in length, appended to a filename to describe the file's content or type.

**Firmware** — Software stored in ROM by a hardware manufacturer for the purposes of expediting processes or protecting company secrets.

**Format** — Specified layout of data, arrangement of text for output, or the placement of text for hard copy.

**Formatting** — Initial magnetic encoding of a floppy disk or other storage medium.

**Fortran** — Formula Translator, a high-level programming language used to solve complex mathematical and scientific problems.

**Full Duplex** — The mode of communications in which two systems will transmit or receive data simultaneously.

**Function Keys** — Special keys on the keyboard that can initiate a function within a program.

**Garbage** — The display or production of meaningless data or nonsensical character sequences.

**Global Search** — A routine to search for every occurrence of a word, phrase, or character in a text file.

**Handshaking** — The protocols used for smooth communication between the CPU and its peripherals.

**Hexidecimal** — The base 16 number system that consists of digits labelled 0-9 and A-F.

**High Resolution** — Technique for improving the quality and accuracy of details on the video display or printer.

**Increment** — Increase in a specified amount by a single integer or unit.

**Instruction** — A code that controls distribution of a signal through the CPU, resulting in performance of a specific operation.

**Interface** — The connection between two devices, or the manner of communication between a program and its user.

**Interpreter** — A language translator that interprets a high level program into machine code one line at a time.

**Justification** — The spacing of text or graphics to produce an even, vertical alignment of the right or left margins.

**K** — Kilobyte, equivalent to 1024 bytes.

**Letter Quality** — The type of print or printer in which characters are fully formed similar to a typewriter character.

**Library** — An organized set of programs or routines used frequently by a program or operating system.

**Line Feed** — The mechanism, character, code or control that causes paper in the printer to advance one line, or the cursor on the screen to move down one line.

**Line Printer** — Any printer that produces one full line of type at a time.

**List** — Display or print a set of items, records, or files in a specified range or sequence.

**Logo** — A program language designed to teach children the principles of program development, utilizing a triangular "turtle" to aid in simple graphics.

**LPM** — Lines Per Minute, a measure of printing speed.

**LPS** — Lines Per Second.

**M or MB** — Megabyte, equivalent to 1,024,000 bytes.

**Machine Code** — A set of instructions specific to a particular processor and consisting of signal control codes.

**Machine Language** — Machine code.

**Main Memory** — The computer's temporary storage space for data and instructions during execution of a program.

**Menu** — A list of options from which a user selects commands or functions, in lieu of entering complicated keyboard sequences.

**MHz** — Million cycles per second or Megahertz, a measure of the speed of a CPU's fetch cycle.

**Modem** — Modular-demodulator used to transmit and receive data over conventional phone lines.

**Monitor** — Computer operating system software. CRT display screen.

**Mouse** — Cursor moving device controlled by planar hand motion.

**MTBF** — Mean Time Between Failure, an index of hardware reliability.

**Network** — A series of interconnected computers, peripherals, or terminals for the purposes of sharing data and software among multiple users.

**Multi-User** — Computer designed for simultaneous use by more than a single operator.

**Nibble** — Four bits or half of a byte.

**Number Crunching** — Unusually complex or repetitive arithmetic functions.

**Operating System** — Control software that manages the transmission of data between the computer and its peripheral devices, organizes disk files, and interprets keyboard input.

**Parallel** — A method of data transmission whereby all bits in a given byte are transferred simultaneously.

**Parity Check** — Error detection technique to check the accuracy of a computer word after transmission.

**Pascal** — A straightforward high-level programming language named after the mathematician Blaise Pascal.

**Peripheral** — A computer's input or output device, usually a keyboard, CRT, printer, or disk drive.

**Plotter** — Hardware or software that produces hard copy output of graphic images.

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**Plug Compatible** — Able to be interconnected without modification to either hardware or software.

**Port** — The input/output connection for interfacing computers and peripherals by male or female connectors.

**Printout** — Hard copy of stored or processed data produced by a printer.

**PROM** — Programmable Read-Only Memory.

**Proportional Spacing** — Printing method by which the printer spaces text in tiny increments to compensate for the varying widths of the characters.

**Protected** — Legally or programatically guarded against copyright infringement or use by others.

**Query** — In a data base management system, the process of accessing data stored in a data file.

**RAM** — Random Access Memory, where instructions and data are held during processing.

**ROM** — Read Only Memory, containing proprietary data or programming that cannot be altered or erased by the user.

**Relocatable** — A program or group of data that can be placed anywhere in memory for execution.

**Report Generator** — Software that produces hard copy output using designated specifications and existing data.

**RPG** — Report Program Generation language, a high level programming language popular for business applications.

**RS-232 or RS-232C** — A nearly fairly standard interface for serial communication between computers and peripheral devices.

**Screen Dump** — To transfer data or images from a terminal display to storage or to a peripheral for printing.

**Scrolling** — Vertical or horizontal display of text or images too long or wide for the monitor screen.

**Sector** — A unit or organization for data storage on a magnetic disk.

**Sequential Access** — Information that must be retrieved in the same order in which it was originally stored.

**Serial** — Transmission of data bit by bit.

**Slice** — Two bits.

**Syntax** — The rules of usage defining the structure of a programming language.

**Tutorial** — Computer-administered lessons, usually prefacing an application program.

**User Friendly** — Unintimidating, easy to use, and free of esoteric computer terminology.

**Word Wrap** — Automatic relocation of a word from the end of a text line to the next succeeding line.

**Zap** — Clear the monitor screen to blanks and erase the data or text displayed.

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---

## Title Index

---

747 Landing Simulator .....	281	Basic Arithmetic .....	158
ABCs .....	89	BASIC Compiler .....	357
Addition With Carrying .....	154	Basketball .....	301
Advanced Fingerspelling .....	114	Battling Bugs/Concentration .....	159
Advanced Musicsystem .....	197	Beginning Algebra .....	159
Adventures of Oswald .....	89	Blast Off .....	141
AlgiCalc .....	154	Blue Max .....	225
Ali Baba & the Forty Thieves .....	320	Bomber Attack .....	226
Alien Addition .....	155	Bookkeeper .....	78
Alley Cat .....	219	Bootleg .....	227
Alligator Mix .....	156	Bridge Master .....	302
Alphabet Zoo .....	90	Bug Off! .....	228
Anti-Sub Patrol .....	219	Bumble Plot .....	160
Antonyms .....	143	Bumblebee .....	90
Apple Panic .....	220	Buried Bucks .....	228
Arcade Machine .....	221	Calculus Demon .....	161
Ardy the Aardvark .....	222	Car Costs .....	48
Arithmetic Classroom .....	156	Caterpiggle .....	229
Arithmetic Skills .....	112	Caterpillars .....	103
Astrology .....	114	Centipede .....	230
ATARI Logo .....	354	Chameleon .....	364
ATARI MicroSoft BASIC II .....	355	Chem Lab Simulations .....	187
ATARI Pascal (Version 2.0) .....	355	Chicken .....	231
ATARI Pilot .....	356	Circuit Lab .....	189
ATARI PLATO .....	207	Clinical Reading .....	145
Atari Program-Text Editor .....	363	Clipper: Around the Horn in 1850 .....	320
Atari Sentences .....	115	Close Assault .....	302
ATARI Super PILOT .....	357	Clowns and Balloons .....	231
AtariArtist .....	345	Compu-Math: Fractions .....	162
AtariLab Light Module .....	186	Compu-Math: Decimals .....	162
AtariLab Starter Set with Temperature Module .....	186	Compu-Read .....	116
AtariMusic I .....	197	Computer Chess .....	303
AtariMusic II .....	198	Computer War .....	232
AtariWriter .....	27	Concentration .....	117
Atlantis .....	223	Counting Practice .....	111
Aztec Challenge .....	223	Counting .....	117
B-1 Nuclear Bomber .....	224	Crater Raider .....	233
Back to Basics Accounts Payable .....	77	Crossfire .....	234
Back to Basics Accounts Receivable .....	77	Crypt of Media .....	321
Back to Basics .....	76	Crypts of Terror .....	322
Backgammon 2.0 .....	300	Curse of RA .....	323
Bandits .....	225	Cut & Paste .....	30
Bank Street Writer .....	28	Dandy .....	234
Baseball .....	300	Darts .....	304
		Data Base/Report .....	64
		Data Perfect .....	65

---

David's Midnight Magic .....	235
DDT .....	365
Deadline .....	323
Deadly Duck .....	236
Death in the Caribbean .....	324
Deep Blue C .....	358
Delta Drawing .....	346
Deluxe Invaders .....	236
Demolition Division .....	163
Demons Forge .....	325
Details .....	118
Diascriptive I .....	118
Diascriptive II .....	119
Dig Dug .....	237
Dino Eggs .....	238
DiskAssembler .....	365
Diskey .....	366
Division Drill .....	164
Donkey Kong .....	238
Downhill .....	239
Dragon Games .....	120
Dragon Mix .....	164
DragonHawk .....	240
Draw .....	99
Drawit .....	347
Drelbs .....	241
Earth Science .....	189
Edit 6502 .....	359
Elementary Biology .....	190
Embargo .....	241
Encounter .....	242
Estimation Skill Builder-	
Whole Numbers .....	165
Excalibur .....	119
Face Flash .....	91
Facemaker .....	92
Factory, The .....	121
Famous Sayings .....	106
Figure Fun .....	166
File Fax .....	66
File It .....	67
File Manager 800+ .....	68
Final Orbit .....	243
Fingerspelling .....	122
Firebird .....	244
First Letter .....	104
Fishing for Homonyms .....	122
Flying Ace .....	244
Fort Apocalypse .....	245
Fraction Fever .....	167
Franglais .....	123
Frenzy and Flip Flop .....	167
Frogger .....	245
Frogmaster .....	191
Galahad and the Holy Grail .....	326
Game Machine .....	246
Geography .....	124
GeoKey .....	141
Gertrude's Secrets .....	92
Getaway .....	247
Golf Classic and Compubar .....	168
Graphing .....	169
Graphing	
Exponential Functions .....	169
Gridiron Glory .....	304
Gulp/Arrow Graphics .....	170
Guns of Fort Defiance .....	305
Hard Hat Mack .....	248
Haunted Hill .....	249
Hex-a-Bug .....	366
Hey Diddle Diddle .....	93
Hickory Dickory .....	94
Hidden Words .....	95
Hodge Podge .....	95
Home Accountant .....	48
Home Financial Management .....	49
Home Inventory .....	50
HomeWord .....	31
How to Read .....	
in the Content Areas .....	124
Humpty Dumpty/Jack and Jill .....	249
I'm Different .....	96
In Search of .....	
the Most Amazing Thing .....	97
Independent Reading Level Test .....	125
Inference .....	118
Integers and Integer Fast Facts .....	171
Introducing-Peter and the Wolf .....	199
Jawbreaker .....	250
Jokes & Riddles .....	106
Juggles' Butterfly .....	98
Juggles' Rainbow .....	98
Juggles' Windmill .....	98
Jukebox One .....	200
Jumbo Jet Pilot .....	251
Jumpman .....	251
Keyboard Organ .....	200
Kids on Keys .....	99
Kindercomp .....	99

King Arthur's Heir . . . . .	326	Nukewar . . . . .	309
Koalapad Micrilliustrator . . . . .	347	Number Blast . . . . .	179
Letter Builder . . . . .	105	Nursery Rhymes . . . . .	106
Letter Perfect . . . . .	32	O'Riley's Mine . . . . .	263
Letter Recognition . . . . .	116	Oil's Well . . . . .	260
Letter Recognition Drill . . . . .	112	Old Ironsides . . . . .	260
Letterman . . . . .	100	On Court Tennis . . . . .	261
Literal Comprehension . . . . .	145	One on One with Larry Bird and Dr. J . . . . .	262
Lode Runner . . . . .	252	Pacific Coast Highway . . . . .	264
Lunar Leeper . . . . .	253	Paris in Danger . . . . .	309
MAE . . . . .	360	Parts of the Microscope . . . . .	192
Magic Spells . . . . .	125	Pensate . . . . .	310
Main Idea . . . . .	118	Percentages . . . . .	178
Major League Hockey . . . . .	306	Phone Home . . . . .	204
Maniac Miner . . . . .	253	Picture Blocks . . . . .	102
Market Place, The . . . . .	172	Piano Tuner . . . . .	203
MasterType . . . . .	126	Picnic Paranoia . . . . .	264
Matchboxes . . . . .	101	Pictures . . . . .	104
Math Conqueror . . . . .	172	Pie Man . . . . .	265
Math Facts and Games . . . . .	174	Pipes . . . . .	311
Mathematics Courseware, Plane Geometry . . . . .	173	Pitstop . . . . .	266
Meltdown . . . . .	254	Player Maker . . . . .	349
Memory Builder: Concentration . . . . .	127	Player Piano . . . . .	204
Meteor Multiplication . . . . .	175	Pool . . . . .	312
Metric & Problem Solving . . . . .	175	Pool 1.5 . . . . .	311
Mickey & the Great Outdoors . . . . .	101	Pooyan . . . . .	267
Microsailing . . . . .	254	Pop On . . . . .	136
MicroTeach . . . . .	208	Popeye . . . . .	267
Midway Campaign . . . . .	306	Practice Makes Perfect . . . . .	209
Millionaire . . . . .	307	Pre-Reading . . . . .	103
Miner 2049er . . . . .	255	Pre-School Fun . . . . .	104
Minus Mission . . . . .	176	Predictor, The . . . . .	42
Mix Up . . . . .	136	Prefixes . . . . .	129
Monkey up a Tree . . . . .	177	Preparing for the SAT . . . . .	130
Montana Reading . . . . .	128	Preppie . . . . .	268
Moon Shuttle . . . . .	256	Preppie II . . . . .	269
Moondust . . . . .	256	Preschool IQ Builder . . . . .	104
Morsecode Master . . . . .	191	Presidents of the United States . . . . .	131
Mouskeattack . . . . .	257	Protector . . . . .	269
Mr. Cool . . . . .	258	Pushky . . . . .	270
Multiplying Binomials . . . . .	178	Puzzler . . . . .	105
Music Series I, II, & III . . . . .	202	Q*Bert . . . . .	271
Musical Pilot . . . . .	201	Quarxon . . . . .	273
My Spelling Easel . . . . .	128	Quasimodo . . . . .	272
Name Rondo . . . . .	202	Quest for Tires . . . . .	274
Names . . . . .	99	Questron . . . . .	327
Necromancer . . . . .	258	Rainbow Walker . . . . .	274
Night Mission Pinball . . . . .	259	Rapid Words . . . . .	116
North Atlantic Convoy Raider . . . . .	308		

Readability Index . . . . .	131	Spy vs Spy . . . . .	315
Reading Comprehension . . . . .	132	Spy's Demise . . . . .	288
Repton . . . . .	275	Star Trek . . . . .	290
Return of the Wuzzle . . . . .	118	Starcross . . . . .	330
Rhymes & Riddles . . . . .	106	Starware . . . . .	195
Ringmaster . . . . .	276	Stickybear ABC . . . . .	108
River Rescue . . . . .	277	Stickybear Basket Bounce . . . . .	289
Robin's Halloween . . . . .	107	Stickybear BOP . . . . .	109
Rosen's Brigade . . . . .	277	Stickybear Numbers . . . . .	109
RPN Calculator . . . . .	43	Stickybear Shapes . . . . .	110
Salmon Run . . . . .	278	Story Builder . . . . .	111
Same and Different . . . . .	105	Story Machine . . . . .	138
Sammy the Sea Serpent . . . . .	107	Stratos . . . . .	291
Saratoga . . . . .	313	Success With Math: Addition/Subtraction . . . . .	180
Sargon II . . . . .	314	Success With Math: Linear Equations . . . . .	181
Saucer Shoot . . . . .	118	Success With Math: Multiplication/Division . . . . .	181
Science One: The Human Body . . . . .	193	Success With Math: Quadratic Equations . . . . .	182
Scram . . . . .	279	Suspended . . . . .	331
Screen Dump Utility . . . . .	367	Swamp Chomp . . . . .	292
Screen Maker . . . . .	349	Synassembler . . . . .	360
Scribble . . . . .	99	SynCalc . . . . .	43
Sea Bandit . . . . .	280	Synchron . . . . .	80
Sea Dragon . . . . .	280	SynComm . . . . .	368
Seastalker . . . . .	328	SynFile Plus . . . . .	69
Secret Formula . . . . .	179	Synonyms . . . . .	143
Sentences . . . . .	116	Synonyms & Antonyms . . . . .	116
Sequences . . . . .	118	SynStock . . . . .	51
Serpentine . . . . .	282	SynTax . . . . .	52
Shamus: Case II . . . . .	329	SynTrend . . . . .	350
Shapes . . . . .	104	T.A.C. . . . .	293
Shootout at the OK Galaxy . . . . .	283	T.G.I.F. . . . .	317
Simulated Computer . . . . .	194	Tank Trap . . . . .	293
Sky Blazer . . . . .	282	Target Practice . . . . .	294
Slime . . . . .	284	Teacher's Pet . . . . .	111
Smash . . . . .	142	Teddy's Magic Balloon . . . . .	112
Smile . . . . .	117	Temple of Apshai . . . . .	332
Smile More . . . . .	118	Text Formatter . . . . .	33
Snark Hunt . . . . .	285	Text Wizard . . . . .	34
Soccer . . . . .	315	The Bookkeeper . . . . .	78
Space Invaders . . . . .	285	The Pond . . . . .	103
Space War . . . . .	286	Three R Math Home System . . . . .	182
Spaceship . . . . .	118	Toltec Pyramid . . . . .	139
Spellagraph . . . . .	133	Trains . . . . .	103
Spellbound . . . . .	134	Trap-A-Zoids . . . . .	183
Spelling Builder . . . . .	135	Treasure Quest . . . . .	316
Spelling Bee . . . . .	134	Turmoil . . . . .	295
Spelling Genie . . . . .	136	Twerps . . . . .	296
Spelling in Context . . . . .	137		
Spelltronics . . . . .	138		
Spider Quake . . . . .	287		
Spy Strikes Back, The . . . . .	287		

Type Attack .....	<b>140</b>	Wizard of Words .....	<b>147</b>
U.S. Geography - High Marc .....	<b>141</b>	Word Factory .....	<b>148</b>
U.S. Geography - Check Marc .....	<b>141</b>	Word Scrambler/Spelling Tutor .....	<b>150</b>
Using Phonics .....	<b>142</b>	Word Scramble .....	<b>149</b>
Video Easel .....	<b>351</b>	Wordgames .....	<b>150</b>
VisiCalc .....	<b>45</b>	WORDGO .....	<b>148</b>
Vocabulary .....	<b>118</b>	Wordmate .....	<b>151</b>
Vocabulary Builder .....	<b>143</b>	Words .....	<b>104</b>
Wanted .....	<b>143</b>	Writing Competency .....	<b>152</b>
Webster: The Word Game .....	<b>144</b>	Zaxxon .....	<b>296</b>
Weird & Wacky World .....	<b>145</b>	Zeppelin .....	<b>297</b>
Wild & Crazy World .....	<b>145</b>	Zombies .....	<b>334</b>
Witness, The .....	<b>333</b>	Zork I: The Great Underground Empire .....	<b>335</b>
Wiz Type .....	<b>146</b>	Zork II: The Wizard of Frobuzz .....	<b>336</b>
Wizard and the Princess .....	<b>334</b>	Zork III: Dungeon Master .....	<b>337</b>

## Cross Reference by Vendor

<b>Adventure International</b>	Bug Off! . . . . .	228
	Diskey . . . . .	366
	Preppie . . . . .	268
	Sea Dragon . . . . .	280
	Stratos . . . . .	291
	Treasure Quest . . . . .	316
<b>Analog APX</b>	Buried Bucks . . . . .	228
	747 Landing Simulator . . . . .	281
	Advanced Fingerspelling . . . . .	114
	Advanced Musicsystem . . . . .	197
	Astrology . . . . .	114
	ATARI Super PILOT . . . . .	357
	Bootleg . . . . .	227
	Caterpiggle . . . . .	229
	Circuit Lab . . . . .	189
	Dandy . . . . .	234
	Downhill . . . . .	239
	Drawit . . . . .	347
	Fingerspelling . . . . .	122
	Galahad and the Holy Grail . . . . .	326
	Getaway . . . . .	247
	Gridiron Glory . . . . .	304
	Jukebox One . . . . .	200
	Keyboard Organ . . . . .	200
	Letterman . . . . .	100
	Microsailing . . . . .	254
	Monkey up a Tree . . . . .	177
	Morsecode Master . . . . .	191
	Musical Pilot . . . . .	201
	Number Blast . . . . .	179
	Phone Home . . . . .	204
	Piano Tuner . . . . .	203
	Player Maker . . . . .	349
	Player Piano . . . . .	204
	Presidents of the United States . . . . .	131
	Puzzler . . . . .	105
	Quarxon . . . . .	273
	Ringmaster . . . . .	276
	Saratoga . . . . .	313
	Screen Maker . . . . .	349
	Space War . . . . .	286
	Starware . . . . .	195
	Three R Math Home System . . . . .	182
	WORDGO . . . . .	148
<b>Artworx</b>	DiskAssembler . . . . .	365
	Hodge Podge . . . . .	95
	Predictor, The . . . . .	42

---

<b>Atari</b>	
AlgCalc . . . . .	154
Alien Addition . . . . .	155
Alligator Mix . . . . .	156
ATARI Logo . . . . .	354
ATARI MicroSoft BASIC II . . . . .	355
ATARI Pascal (Version 2.0) . . . . .	355
ATARI Pilot . . . . .	356
Atari Program-Text Editor . . . . .	363
Atari Sentences . . . . .	115
AtariArtist . . . . .	345
AtariLab Light Module . . . . .	186
AtariLab Starter Set with Temperature Module . . . . .	186
AtariMusic I . . . . .	197
AtariMusic II . . . . .	198
AtariWriter . . . . .	27
Basketball . . . . .	301
Blast Off . . . . .	141
Bookkeeper, The . . . . .	78
Calculus Demon . . . . .	161
Centipede . . . . .	230
Chameleon . . . . .	364
Computer Chess . . . . .	303
Concentration . . . . .	117
DDT . . . . .	365
Data Base/Report . . . . .	64
Deep Blue C . . . . .	358
Demolition Division . . . . .	163
Dig Dug . . . . .	237
Division Drill . . . . .	164
Donkey Kong . . . . .	238
Dragon Mix . . . . .	164
Excalibur . . . . .	119
Frogmaster . . . . .	191
GeoKey . . . . .	141
Hex-a-Bug . . . . .	366
Hickory Dickory . . . . .	94
I'm Different . . . . .	96
Introducing - Peter and the Wolf . . . . .	199
Juggles' Butterfly . . . . .	98
Juggles' Rainbow . . . . .	98
Juggles' Windmill . . . . .	98
Math Facts and Games . . . . .	174
Meteor Multiplication . . . . .	175
Minus Mission . . . . .	176
Mix Up . . . . .	136
My Spelling Easel . . . . .	128
Name Rondo . . . . .	202
Pop On . . . . .	136
Preppie II . . . . .	269
Pushky . . . . .	270
RPN Calculator . . . . .	43
Salmon Run . . . . .	278

	Scram .....	279
	Screen Dump Utility .....	367
	Secret Formula .....	179
	Smash .....	142
	Snark Hunt .....	285
	Space Invaders.....	285
	Spelling Genie .....	136
	Spelling in Context .....	137
	Text Formatter .....	33
	U.S. Geography - Check Marc.....	141
	U.S. Geography - High Marc.....	141
	Video Easel .....	351
<b>Avalon Hill</b>	B-1 Nuclear Bomber .....	224
	Bomber Attack .....	226
	Close Assault .....	302
	Flying Ace .....	244
	Guns of Fort Defiance .....	305
	Midway Campaign .....	306
	North Atlantic Convoy Raider .....	308
	Nukewar.....	309
	Paris in Danger .....	309
	Shootout at the OK Galaxy .....	283
	T.A.C. .....	293
	T.G.I.F. .....	317
<b>Blue Chip Software</b>	Millionaire .....	307
<b>Boone</b>	Crater Raider .....	233
	Demons Forge .....	325
<b>Brain Bank</b>	Science One: The Human Body .....	193
<b>Bram</b>	Zombies .....	334
<b>Broderbund</b>	Apple Panic .....	220
	Arcade Machine .....	221
	Bank Street Writer .....	28
	David's Midnight Magic.....	235
	Lode Runner .....	252
	Matchboxes .....	101
	Serpentine .....	282
	Sky Blazer .....	282
<b>CBS Software</b>	Success With Math: Addition/Subtraction .....	180
	Success With Math: Linear Equations .....	181
	Success With Math: Multiplication/Division.....	181
	Success With Math: Quadratic Equations .....	182
	Webster: The Word Game .....	144
	MicroTeach .....	208
	Home Accountant.....	48
<b>CompuMax</b>	ATARI PLATO .....	207
<b>Continental Software</b>	A	
<b>Control Data Corporation</b>	Meltdown .....	254
<b>Cosi</b>	Bumblebee .....	90
<b>Creative Software</b>	Car Costs .....	48
	DragonHawk .....	240
	Home Inventory .....	50

---

<b>DataMost</b>	Moondust . . . . .	256
<b>Datasoft</b>	Pipes . . . . .	311
	Ardy the Aardvark . . . . .	222
	BASIC Compiler . . . . .	357
	Clowns and Balloons . . . . .	231
	Moon Shuttle . . . . .	256
	O'Riley's Mine . . . . .	263
	Pacific Coast Highway . . . . .	264
	Pooyan . . . . .	267
	Text Wizard . . . . .	34
<b>Designware</b>	Spellagraph . . . . .	133
	Trap-A-Zoids . . . . .	183
<b>Disney Productions</b>	Mickey & the Great Outdoors . . . . .	101
<b>Dynacomp</b>	Backgammon 2.0 . . . . .	300
<b>Edu-Ware</b>	Bridge Master . . . . .	302
	Compu-Math: Decimals . . . . .	162
	Compu-Math: Fractions . . . . .	162
	Compu-Read . . . . .	116
	Letter Recognition . . . . .	116
	Rapid Words . . . . .	116
	Sentences . . . . .	116
	Synonyms & Antonyms . . . . .	116
<b>Educational Activities</b>	Clinical Reading . . . . .	145
	Details . . . . .	118
	Diascriptive I . . . . .	118
	Diascriptive II . . . . .	119
	Dragon Games . . . . .	120
	Graphing Exponential Functions . . . . .	169
	How to Read in the Content Areas . . . . .	124
	Independent Reading Level Test . . . . .	125
	Inference . . . . .	118
	Literal Comprehension . . . . .	145
	Main Idea . . . . .	118
	Math Conqueror . . . . .	172
	Parts of the Microscope . . . . .	192
	Percentages . . . . .	178
	Readability Index . . . . .	131
	Sequences . . . . .	118
	Spelltronics . . . . .	138
	Toltec Pyramid . . . . .	139
	Using Phonics . . . . .	142
	Vocabulary . . . . .	118
	Weird & Wacky World . . . . .	145
	Wild & Crazy World . . . . .	145
	Writing Competency . . . . .	152
<b>EduFun</b>	Battling Bugs/Concentration . . . . .	159
	Frenzy and Flip Flop . . . . .	167
	Golf Classic and Compubar . . . . .	168
	Gulp/Arrow Graphics . . . . .	170
<b>Edusoft</b>	Estimation Skill Builder-Whole Numbers . . . . .	165
	Integers and Integer Fast Facts . . . . .	171
	Simulated Computer . . . . .	194

---

<b>Electronic Arts</b>	Cut & Paste .....	30
	Hard Hat Mack .....	248
	One on One with Larry Bird and Dr. J .....	262
<b>Epyx</b>	Curse of Ra .....	323
	Jumpman .....	251
	Pitstop .....	266
	Temple of Apshai .....	332
<b>Gamestar</b>	On Court Tennis .....	261
<b>Gebelli</b>	Embargo.....	241
	Firebird.....	244
<b>Gentry</b>	Maniac Miner .....	253
	Rosen's Brigade.....	277
	Sea Bandit .....	280
	Spider Quake .....	287
	Target Practice .....	294
<b>Gryphon Systems</b>	King Arthur's Heir .....	326
<b>Hayden Software</b>	Sargon II .....	314
<b>HesWare</b>	Protector .....	269
<b>High Technology Software</b>	Chem Lab Simulations .....	187
<b>Imagic</b>	Atlantis.....	223
<b>Infocom</b>	Deadline .....	323
	Seastalker .....	328
	Starcross.....	330
	Suspended .....	331
	Witness, The .....	333
	Zork I: The Great Underground Empire .....	335
	Zork II: The Wizard of Frobozz .....	336
	Zork III: Dungeon Master .....	337
<b>Inhome</b>	Baseball .....	300
	Crypts of Terror .....	322
	Pool 1.5 .....	311
	ABCs .....	89
<b>Innovative Design</b>	Multiplying Binomials .....	178
<b>JMH</b>	Koalapad MicroIllustrator .....	347
<b>JMH Software of Minnesota</b>	Bumble Plot .....	160
<b>Koala Pad Learning Company</b>	Gertrude's Secrets .....	92
<b>LJK</b>	Data Perfect.....	65
	Edit 6502 .....	359
	Letter Perfect.....	32
<b>Matrix</b>	Bookkeeper .....	78
<b>MECC</b>	Basic Arithmetic .....	158
	Caterpillars .....	103
	Counting .....	117
	Earth Science .....	189
	Elementary Biology.....	190
	First Letter .....	104
	Geography .....	124
	Graphing .....	169
	Market Place, The .....	172
	Metric & Problem Solving .....	175
	Music Series I, II, & III .....	202

Pictures . . . . .	104
Practice Makes Perfect . . . . .	209
Prefixes . . . . .	129
Pre-Reading . . . . .	103
Return of the Wuzzle . . . . .	118
Saucer Shoot . . . . .	118
Shapes . . . . .	104
Smile . . . . .	117
Smile More . . . . .	118
Spaceship . . . . .	118
Spelling Bee . . . . .	134
Trains . . . . .	103
Wordgames . . . . .	150
Words . . . . .	104
<b>Micro Lab</b>	
Death in the Caribbean . . . . .	324
Dino Eggs . . . . .	238
Miner 2049er . . . . .	255
Face Flash . . . . .	91
<b>Milliken Opportunities For Learning</b>	
Facemaker . . . . .	92
Magic Spells . . . . .	125
Wizard of Words . . . . .	147
Word Factory . . . . .	148
Word Scrambler/Spelling Tutor . . . . .	150
Popeye . . . . .	267
Q*Bert . . . . .	271
Back to Basics . . . . .	76
Back to Basics - Accounts Payable . . . . .	77
Back to Basics - Accounts Receivable . . . . .	77
Pensate . . . . .	310
Pie Man . . . . .	265
Spy Strikes Back, The . . . . .	287
Spy's Demise . . . . .	288
<b>Parker Brothers</b>	
Adventures of Oswald . . . . .	89
Antonyms . . . . .	143
Beginning Algebra . . . . .	159
Clipper: Around the Horn in 1850 . . . . .	320
Franglais . . . . .	123
Game Machine . . . . .	246
Letter Builder . . . . .	105
Memory Builder: Concentration . . . . .	127
Montana Reading . . . . .	128
Picture Blocks . . . . .	102
Preparing for the SAT . . . . .	130
Preschool IQ Builder . . . . .	104
Reading Comprehension . . . . .	132
Robin's Halloween . . . . .	107
Same and Different . . . . .	105
Sammy the Sea Serpent . . . . .	107
Spelling Builder . . . . .	135
Spy vs Spy . . . . .	315
Story Builder . . . . .	111
Swamp Chomp . . . . .	292
<b>Penguin Software</b>	
<b>Peachtree</b>	
<b>Program Design</b>	

---

<b>Quality Software</b>	Synonyms.....	143
	Teddy's Magic Balloon.....	112
	Vocabulary Builder.....	143
<b>Roklan</b>	Ali Baba & the Forty Thieves.....	320
	Tank Trap .....	293
<b>Scarborough Systems</b>	Anti-Sub Patrol.....	219
<b>Sega</b>	Deluxe Invaders.....	236
<b>Sierra On-Line</b>	MasterType .....	126
	Star Trek .....	290
	Crossfire.....	234
	Frogger .....	245
	Homeword .....	31
	Jawbreaker.....	250
	Lunar Leeper .....	253
	Mr. Cool.....	258
	Mouskeattack .....	257
	Oil's Well .....	260
	Quest for Tires .....	274
	Wiz Type .....	146
	Wizard and the Princess .....	334
<b>Sir-Tech Software</b>	Crypt of Media .....	321
<b>Sirius</b>	Bandits .....	225
	Deadly Duck .....	236
	Final Orbit .....	243
	Repton .....	275
	Turmoil .....	295
	Twerps .....	296
	Type Attack .....	140
<b>Software Arts</b>	VisiCalc .....	45
<b>Spinnaker</b>	Alphabet Zoo.....	90
	Delta Drawing .....	346
	Draw .....	99
	Famous Sayings .....	106
	Fraction Fever .....	167
	Hey Diddle Diddle .....	93
	In Search of the Most Amazing Thing .....	97
	Jokes & Riddles .....	106
	Kids on Keys .....	99
	Kindercomp .....	99
	Names .....	99
	Nursery Rhymes .....	106
	Rhymes & Riddles .....	106
	Scribble .....	99
	Story Machine .....	138
<b>Sterling Swift</b>	Arithmetic Classroom .....	156
<b>Strategic Simulations</b>	Questron.....	327
<b>Sublogic</b>		
<b>    Communications</b>	Night Mission Pinball .....	259
<b>    Sunburst</b>	Factory .....	121
<b>Swifty Software</b>	Pond, The .....	103
	File It .....	67
	Haunted Hill .....	249

---

<b>Synapse</b>	Alley Cat . . . . .	<b>219</b>
	Blue Max . . . . .	<b>225</b>
	Chicken . . . . .	<b>231</b>
	Drelbs . . . . .	<b>241</b>
	Encounter . . . . .	<b>242</b>
	File Manager 800+ . . . . .	<b>68</b>
	Fort Apocalypse . . . . .	<b>245</b>
	Necromancer . . . . .	<b>258</b>
	Picnic Paranoia . . . . .	<b>264</b>
	Quasimodo . . . . .	<b>272</b>
	Shamus: Case II . . . . .	<b>329</b>
	Slime . . . . .	<b>284</b>
	Synassembler . . . . .	<b>360</b>
	SynCalc . . . . .	<b>43</b>
	Synchron . . . . .	<b>80</b>
	SynComm . . . . .	<b>368</b>
	SynFile Plus . . . . .	<b>69</b>
	SynStock . . . . .	<b>51</b>
	SynTax . . . . .	<b>52</b>
	SynTrend . . . . .	<b>350</b>
	Zaxxon . . . . .	<b>296</b>
	Zeppelin . . . . .	<b>297</b>
<b>THESIS</b>	Arithmetic Skills . . . . .	<b>112</b>
	Counting Practice . . . . .	<b>111</b>
	Fishing for Homonyms . . . . .	<b>122</b>
	Hidden Words . . . . .	<b>95</b>
	Letter Recognition Drill . . . . .	<b>112</b>
	Pre-School Fun . . . . .	<b>104</b>
	Spellbound . . . . .	<b>134</b>
	Teacher's Pet . . . . .	<b>111</b>
	Wanted . . . . .	<b>143</b>
	Word Scramble . . . . .	<b>149</b>
	Wordmate . . . . .	<b>151</b>
	Computer War . . . . .	<b>232</b>
	Darts . . . . .	<b>304</b>
	Figure Fun . . . . .	<b>166</b>
	Home Financial Management . . . . .	<b>49</b>
	Humpty Dumpty/Jack and Jill . . . . .	<b>249</b>
	Jumbo Jet Pilot . . . . .	<b>251</b>
	Major League Hockey . . . . .	<b>306</b>
	Pool . . . . .	<b>312</b>
	River Rescue . . . . .	<b>277</b>
	Soccer . . . . .	<b>315</b>
	File Fax . . . . .	<b>66</b>
	Old Ironsides . . . . .	<b>260</b>
	Stickybear ABC . . . . .	<b>108</b>
	Stickybear Basket Bounce . . . . .	<b>289</b>
	Stickybear BOP . . . . .	<b>109</b>
	Stickybear Numbers . . . . .	<b>109</b>
	Stickybear Shapes . . . . .	<b>110</b>
<b>TMQ</b>		
<b>Xerox</b>		



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